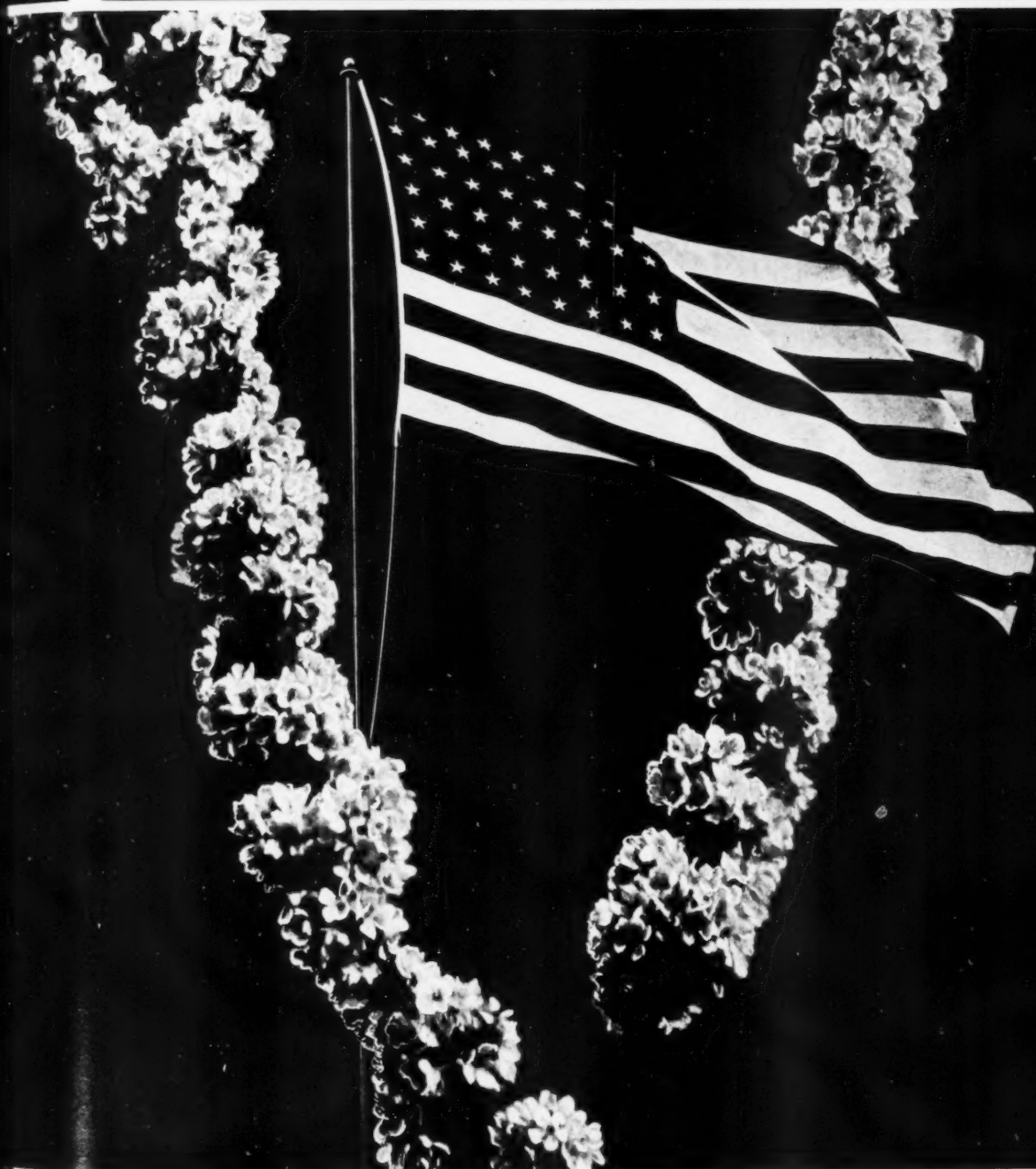


FORESTS



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JULY 1943



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AMERICAN FORESTS

VOLUME 49

JULY, 1943

NUMBER 7

Editor
OVID BUTLER

Associate Editors
LILIAN CROMELIN ERLE KAUFFMAN

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American Forests

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The American Forestry Association, founded in 1875, is a citizens' organization for the advancement of intelligent management and use of the country's forests and related resources of soil, water, wildlife and outdoor recreation.

Its educational activities seek to bring about a better appreciation and handling of these resources, whether publicly or privately owned, that they may contribute permanently to the welfare of the nation and its people.

In addition to publication of its magazine—AMERICAN FORESTS—designed to keep before the people of the country important conservation questions and issues, the Association carries on educational work in various fields including forest fire prevention, reforestation, protection of wildlife, prevention of soil erosion, preservation of wilderness areas, establishment of national forests and parks, advancement of forestry by private endeavor, the teaching of conservation in schools and the promotion of research in timber growing and forest utilization.

The Association is independent and non-commercial, and has no connection with any federal or state governments. Its resources and income are devoted to the advancement of conservation in the interests of public welfare, and all citizens are welcomed to membership.

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The Forest Exchange

Wanted—200-Year-Old Dead Trees

SIR: I am very much interested in the age of large trees and the relation of their rings of growth to rainfall, etc. As far as I have discovered not much has been done on that based on eastern trees.

Several years ago I obtained a section of a tulip tree from Mt. Hamilton which was forty-two inches in diameter and had 128 rings, taking it from 1934 back to 1807. Then from Weather Bureau publications I was able to plot a local curve of the rainfall from 1817. They coincided remarkably close, but do not at all satisfactorily coincide with Carnegie Institution sunspot records from 1885 to 1936. Western tree rings and rainfall seem to come much closer to the sunspot record.

I would like very much to be able to plot the tree rings for some of the larger trees in the East if any of them die and are available for study. If you know of any opportunity for such a study at any time I would appreciate it if you would let me know. It would be very interesting to plot some of the trees of the East 200 or more years old. If rainfall cycles really exist with any fair regularity, plotting a few of them should give the data on which to forecast.

I think it is an established forestry fact that areas denuded of their forests have less rainfall than forested areas. If a few tree ring records of the East could be obtained back 250 years or more it would be an interesting study to see whether the rainfall averaged heavier when the country was sparsely settled than it has since.—*P. L. Ricker*, Washington, D. C.

Concerning "Forest Vista"

SIR: "Forest Vista," appearing on your March cover, deserves a few words of explanation. The photograph was taken in the Androscoggin Ranger District of the White Mountain National Forest by Harold Orne, preeminent photographer of the White Mountains.

The mountain on the skyline is Mount Adams, most distinctive among the northern peaks of the Presidential Range. Hidden in the foreground lies Pinkham Notch and in the middle distance the mouth of the Great Gulf, a glacial cirque whose headwall cuts into the summit of Mount Washington itself.

Both the lone hemlock and the "irrepressible" spruce just behind it were victims of the 1938 New England hurricane—and "Forest Vista" is now preserved only by Harold Orne's unusual

camera study.—*R. S. Monahan*, Alexandria, Virginia.

Connecticut's State Bird

SIR: Connecticut is one of the few last states officially to select a state bird. This was done by the present legislature, in session, and Governor Baldwin has signed the bill by which the American robin was chosen by an overwhelming vote. It seems strange to us that a bird so much liked as the robin and one so prized as a songster and insect destroyer, so friendly and widely distributed, has been neglected among those selected for state birds. Only Michigan has chosen the robin, and this was done in 1931.

Several states have selected the mockingbird, several the cardinal, several the bluebird, and several others the meadow lark. Yet such a good friend to man as the robin was constantly overlooked. Efforts to have a state bird named in Connecticut all failed, as when the state Audubon Society urged before the legislature the name of the rose-breasted grosbeak, and later the song sparrow was favored. Some people wanted the ruby-crowned kinglet named. Now that the robin has received the honors, it has caused widespread satisfaction on the part of bird lovers throughout all Connecticut.—*Harry Edward Miller*, Stratford, Connecticut.

An Invitation

SIR: My new overseer for my Lake Estate near Pinehurst, North Carolina, has for some years been in charge of conservation for Moore County, North Carolina Department of Conservation and Development. I would appreciate having Mr. McCrimmon enrolled as a subscribing member of the Association and in anticipation of this I am enclosing my check for four dollars. If possible I would like him to start with your very excellent May, 1943, issue.

If any of your members are ever down Pinehurst way, I know they would thrill in seeing my more than a thousand acres of longleaf pines—many of them virgin and quite a few not even tapped—perfect specimens, appraised at from 350 to 400 years old. In the midst of this beautiful forest lies an irregular shaped clear water lake of four and one-half miles' shoreline which I built about fourteen years ago. It is fed by six streams and hundreds of springs.

Mr. McCrimmon will be glad to welcome any of your members.—*J. W. Watson*, Wayne, Pennsylvania.

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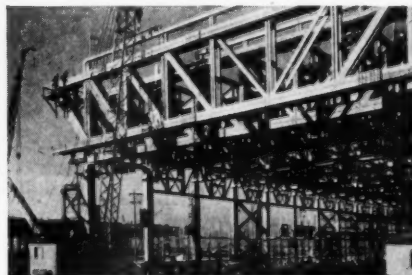
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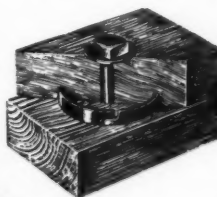
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THE EDITOR'S LOG

The V and the Flag

As every boy knows who has gone into the woods to cut a forked branch for his slingshot, the trees are full of V's. Some trees in their struggle upward to victory form their V's more perfectly than others; some use them sparingly and camouflage them year long with evergreen foliage like the conifers. With the deciduous trees, it is different; nowhere does nature flaunt its V's more profusely and in winter time, more boldly. You will find them in the trees of the forests, in your shade and street trees and in the fruit trees in the orchard, where in the springtime, before the leaves are out, their limbs are velveted with soft colored blossoms.

The cover of this number of AMERICAN FORESTS reproduces one of nature's lovely V's. It is from a full blossom pear tree that grows on the Dickerson Pike just outside Nashville, Tennessee. The photograph was furnished by Leon Cantrell of that city. To him, "Nature's V" has a very special meaning. He writes: "I am thirty-one years old, 1-A in the draft, and a photographer. My hobby is scenic and pictorial photography and I am one of John Kabel's greatest admirers. My ambition is to become a traveling nature photographer just like Mr. Kabel."

The flag superimposed on the photograph likewise has a human story—a tragic one. It is reproduced from a photograph of the stars and stripes carried on her maiden voyage by the ill-fated steamship *Lusitania*, later sunk May 7, 1915, after being torpedoed by a German submarine off the coast of Ireland with the loss of 1,198 lives, of which 124 were Americans.

Thus two wars and two causes—man and nature—are linked in symbolic representation of eternal victory. The design has been worked out by the editors in response to the suggestion of the Treasury Department that July magazine covers carry the flag for victory and in furtherance of the War Bond campaign.

Tobacco and Wood

Ernest Sterling, author of the article "Beating the 'Bush' for Chewing Gum" in this issue, is a consulting forester who has ranged far and wide over the forest lands of the United

States with excursions into the jungles of South America. He is not only wise in the ways of the woods but also in the ways in which forests contribute to the necessities and luxuries of life. His particular "stomping" ground is the pine forests of our southern states.

We were having lunch recently discussing his article on chewing gum. When we lighted our cigarettes, he remarked: "Why don't you have a story on the wood in that cigarette?" Replying that I was not conscious of smoking sawdust, he answered, "You are not but a lot of wood goes into the growing and curing of the tobacco you are smoking. Take North Carolina, for example. I have just been quoted figures showing that more wood in that state is used by tobacco growers than by the pulp mills."

To satisfy a lingering skepticism, I later wrote R. W. Graeber, Extension Forester of North Carolina, and asked him if he thought the Washington heat had affected Sterling's veracity. Here is Graeber's answer:

"It has been estimated that in a normal season and with a normal acreage of tobacco North Carolina farmers use approximately 1,500,000 cords of wood for curing their tobacco crop. This estimate was based in part on the volume of tobacco cured,

We are appropriating sufficient space in the Editor's Log to let the members of the Association know that Lt. Commander O. M. Butler—son of the Editor and Executive Secretary of the Association—assigned to submarine duty in the Pacific, was awarded the Silver Star at Pearl Harbor on June 10th, for "meritorious conduct in action."

THE ASSOCIATE EDITORS

the number of barns used, and the amount of wood required for curing a thousand pounds of tobacco in an average season.

"In the year 1941 the pulpwood cut in North Carolina was 727,400 cords. I have no complete report on the 1942 cut. However, in the spring of 1942, the various pulp mills drawing wood from North Carolina forests indicated an estimate of 952,000 cords for 1942 and 980,900 cords for 1943. These estimates, however, were based upon a different labor situation from what we have today."

So Sterling was right—as respects North Carolina at least. For every cord of wood cut in that state for the pulp mills, better than a cord and a half is cut for the tobacco growers.

"El Porvenir"

The war search for forest and other plant resources of the Central and South American countries is revealing some highly interesting and colorful discoveries. One in point is "El Porvenir," which in Spanish means "The Future." In any language, however, El Porvenir may mean the difference between life and death for thousands of soldiers—and other people, too—because it is a great, neglected plantation run wild with cinchona trees, source of quinine.

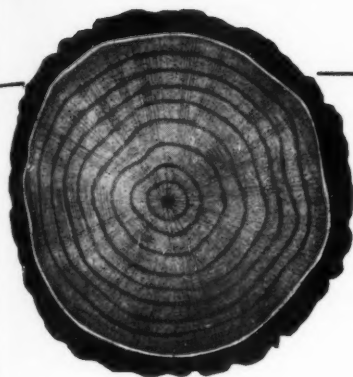
The plantation was discovered in the district of San Marcos, Guatemala. It embraces 17,000 acres of coffee and cinchona trees. With care and development, the cinchona growth, it is estimated, represents twenty-five percent of the quinine now available to the Allies. With a critical shortage of quinine and its main sources in the hands of the Japs, the discovery of this forgotten forest of cinchona trees is a fortuitous find indeed.

El Porvenir, it appears, was started back in 1880 by Justo Rufino Barrios, then President of Guatemala, with the high purpose of diversifying the economy of his country. Coffee, quinine and other crops were planted. Later the undertaking fell into the hands of German interests who formed a corporation under the laws of Delaware called "Capco." Unable

to compete with the cinchona plantations in the Netherlands East Indies, however, El Porvenir's cinchona trees were abandoned and allowed to run wild. In the course of years, they have been reverting to a jungle state.

El Porvenir is now back in the hands of the Guatemalan government and will be managed for the production of quinine. The transfer was accomplished by an agreement worked out among the Guatemalan government, the Central American Plantation Corporation and the United States Board of Economic Warfare. Describing the plantation, the Office of the Coordinator of Inter-American Affairs says:

"Just how many cinchona trees are on the great plantation, comprising



17,000 acres, in the District of San Marcos, has not been determined. Possibilities for growing more cinchona trees are believed to be promising in view of successful experience with cinchona in the Guatemalan highlands.

"The property is near good roads and only nine kilometers from the Pan-American Highway. Bark may be trucked thirty-five miles to Ayutla on the Mexican border. From there it can move to the United States by rail. It will probably be the only cinchona bark to arrive in the United States in substantial quantity by overland transportation.

"A laboratory has been established at El Porvenir for testing the bark. There will be studies as to the best trees, experiments with grafting and transplanting, and setting out of seed beds. Seedlings produced will be used at El Porvenir and elsewhere. . . . The plantation is on the slopes of the extinct volcano Tajmulco, Guatemala's highest mountain.

"The El Porvenir agreement is another achievement of the inter-American agricultural program, under which the Americas are cooperating to replace supply losses in the Far East."

Why a Paper Shortage?

Ever since the paper salvage campaigns of a year or more ago, followed by recent orders of the War Production Board restricting the use of paper, the public has wondered why the shortage and what's in store for the immediate future in respect to paper. Readers of John Strange's article "Paper at War," which appeared in the last number of AMERICAN FORESTS, were given one reason for the shortage of paper for civilian use. It is simply that the war is calling for tremendous quantities of wood pulp and the war has first call.

War needs, however, do not fully answer the question. Donald M. Nelson, Chairman of the War Produc-

tion Board, appearing recently before the House Committee on Interstate and Foreign Commerce, sketched the paper situation pretty much in its entirety. Referring to WPB orders curtailing the use of newsprint and book papers he stated that "under existing war conditions it is impossible to maintain paper production at former levels, let alone the high levels of 1941 and 1942. . . . The increasing demands of the armed forces for pulp and paper products in the prosecution of the war get first call, leaving that which is left for allocation among essential civilian uses." The principal reason for inability to maintain paper production at former levels was given as lack of manpower in the woods.

The production possibilities of the pulp and paper industry on the North American continent, Mr. Nelson pointed out, are dependent on the amount of pulpwood available. Due to present conditions of labor, power and transportation, the outlook for woodpulp production during the present year is twenty-five percent less than that produced in 1942. This means that after meeting all war needs, a reduced balance is available for civilian uses, such as newspapers, magazines, books, etc.

Early this year, civilian consumption of newsprint and book paper was curtailed ten percent. Referring to the prospect of another ten percent curtailment, Mr. Nelson said that it will probably come about October 1 "unless the newspapers fail to achieve the ten percent reduction" called for by the first curtailment. He explained that further reduction of the newsprint supply was not necessary in April as had been anticipated because it was possible to make arrangements with Canada to supply the United States with two and a half million tons of newsprint during 1943 at the rate of about 20,000 tons a month.

Here is how Mr. Nelson sees the newsprint situation today. Requirements for 1943 will call for 3,536,796 tons, of which 2,520,000 tons will come from Canada, 150,000 tons from Newfoundland and 800,000 tons from the United States, leaving an anticipated deficit of about 67,000 tons which Mr. Nelson said is not large enough to cause serious concern. The estimated 1943 production of newsprint as given by Mr. Nelson is approximately 450,000 tons less than was consumed in the United States during the pre-war year of 1941.

The production of newsprint, which is the kind of paper upon which a newspaper is printed, Mr. Nelson told the Committee, "is primarily a Canadian and not a United States problem. Approximately seventy-five percent of the newsprint consumed in the United States is manufactured in Canada. Conversely the great majority of print paper used in magazines, books and commercial printing is manufactured in the United States."

As respects book and magazine paper, Mr. Nelson stated: "Book paper production during the first quarter of 1943 was at the rate of 79.1 percent. This rate of production could not have been maintained during the second quarter had not Canada made available 107,000 tons of pulp above the regular commitment. Canada has advised us that this additional pulp will not be available for the third quarter due to Canada's insufficient wood supply. It may, therefore, be impossible to maintain current levels of production during the third quarter without drawing inventories of pulpwood and pulp to a very low level.

"To date we have tried to balance supply of magazine paper and newsprint so that both industries could operate at approximately the same ratio. It may be extremely difficult to continue this balance unless the supply of pulpwood for pulp mills is appreciably increased."

Referring to the amount of paper of all types used by the government, Mr. Nelson stated that the total requirements of all federal and non-war agencies in 1943 will approximate 1,000,000 tons, with the War Department accounting "for something under half this aggregate." Lend lease requirements, he cited as coming second, Board of Economic Warfare third, Navy Department fourth, Post Office fifth, Treasury sixth and Office of Emergency Management seventh. In the consumption of printing paper, he added, the federal government has effected a 1943 reduction of over forty-two percent. This, he stated, was accomplished "after an intensive reappraisal of the supply and demand situation by individual agencies and the recent realization that extreme economy in paper usage must be practiced by the government."

Ona Rusten



Game animals were a vital element in American pioneer diets. Dressed out weight of most species of deer as packed out of the woods is said to average about 100 pounds, while elk weigh about two and a half times as much. War needs for meat and hides have focused attention on these byproducts of sportsmen's activities as an important economic asset. Wildlife should make its contribution to the war effort, says the author, but the war should not be an excuse for unbridled exploitation of the resources

WILDLIFE CONTRIBUTIONS TO THE WAR

By ALBERT M. DAY

FOOD and other war-induced shortages of animal products have focused public attention on the economic value of the nation's wildlife — including animals, birds and fishes—that we have been protecting and propagating as recreational and esthetic assets. Granted that they should make their contribution to the national welfare in all its aspects, fitting them into the war effort creates some difficult problems.

Many people, for example, want the game laws relaxed, game sanctuaries opened to hunting and commercial fishing regulations liberalized; farmers and

stockmen who are struggling against many obstacles to raise more food than they have ever raised before do not like to see wildlife eating their crops and competing for forage on the range lands—losses that at ordinary times do not generally disturb them greatly.

Public officials, state and national conservation organizations, and individual sportsmen have discussed the problems of wartime wildlife conservation and, notwithstanding unanimity of desire that fish and wildlife play their full part, there is an undercurrent of fear lest this lead to unbridled exploitation.

Having seen the passenger pigeon and the heath hen lost forever, the buffalo, the woodland caribou, the mountain sheep and the sea otter constantly declining in numbers and then in contrast having watched the return of the waterfowl, the antelope, the beavers, the fur seals and the deer, conservationists are loath to countenance interruption of recent progress. The restoration of wildlife is dependent on public appreciation and support built on the foundation of recreation and enjoyment of the out-of-doors, not on the commercial value of the meat, hides, fur or feathers that are its by-



A Roosevelt bull elk on summer range. American sportsmen bag 9,000,000 pounds of elk meat yearly

products. Yet we need these byproducts in our war effort and the civilian economy that must sustain it.

The poundage of meat annually produced from game in this country is as surprising as it is significant. The 1942 reported kill in meat dressed out as are domestic animals in packing plants totals more than 255 million pounds. Deer alone yielded more than fifty-nine million, elk nine million; antelope, bear, moose, mountain sheep and goats totaled sixteen million pounds. Ducks amounted to thirty-two million pounds, geese and brant more than three million, pheasants more than thirty million, rabbits about sixty-nine million, squirrels over twenty-two million. Quail, grouse, partridges, doves, pigeons, turkeys, woodcock, and rails made up the balance. To this was added the enormous poundage of game and commercial fish.

If a similar amount is to be provided in 1943, the hunters and fishermen must continue to harvest it. There are more than eight million licensed hunters in the United States and more than twelve million licensed fishermen. There are also several other millions who are not required to purchase licenses because of age or sex and because several states do not charge license fees for hunting and fishing on an owner's own land.

This quarter of a billion pounds of meat finds its way into American homes as a byproduct of the recreation of millions of people. This is the American concept of the way the harvest should be taken and if it is to continue to produce the most for the good of the country, we do not want to revive pot hunting and the selling of wild game in meat markets. The wartime problem is to harvest but not to over-harvest. Hunters and fishermen are determined and able-bodied individuals. They will probably succeed in getting into the woods and along the streams in spite of transportation difficulties. But no new rods, reels, wading boots or guns are being made for civilian use. Sporting ammunition has pretty much disappeared from dealers' shelves but there is a possibility that enough ammunition will be released by the government so that the harvesting problem can be partially met.

Failure to harvest the game crop means not only a loss of part of the resource, but, in some instances at least, loss of forage and other crops consumed by the excess game. A superabundance of game is bound to raise a cry for relaxation of the game laws and increasing difficulty in enforcement. Resistance on the part of protective agencies to legitimate calls for relief for "more meat" might conceivably result in control being wrested from the agencies set up for care and protection of wildlife, thus perhaps setting back the conserva-

tion program for decades. The situation calls for careful and intelligent handling. The pressing problem of today is how far it is safe to go in utilization of our wildlife resources in time of war.

Not only the meat but hides of certain big game animals are economically valuable. For the past decade the United States has imported an average of nearly a million deer hides a year, mostly from South America and New Zealand. They were used for the manufacture of mocassins, slippers, gloves and other gar-



Big game for small boys — and sometimes their elders. Squirrels and rabbits are "good eating" and together furnish over 90,000,000 pounds of meat annually



ments. Now they are needed for gloves and mukluks for our troops in the Arctic. To meet a war-caused decline in imports and increasing military needs, a plan, worked out by the Army, the War Production Board and the Departments of Agriculture and Interior, calls upon the states to salvage every possible deer and elk hide.

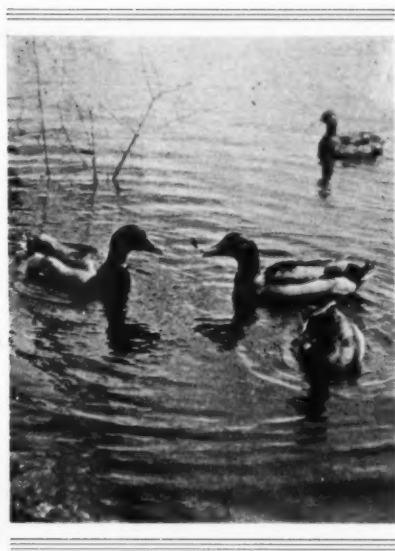
The response has been gratifying. Several states already permit hunters to sell deer skins commercially. In other states, not having such authorization,

the game departments are cooperating wholeheartedly by encouraging hunters to donate the skins and the local game wardens and other personnel are assisting in shipments to the tanneries. In some states where sale of skins is not permitted, arrangements have been made for the states to receive the costs of collection from the hide buyers and in that way the game funds are compensated for the costs incurred in the collection. As a result, more than 162,000 deer and elk skins have been channeled into the leather trade. So important are these skins to the war economy that the War Production Board on March 20, 1943, ordered stoppage of the sale of domestic deer skin leathers except for military purposes. But industrial use of deer and elk hides tends toward the commercializing of wild game, and every safeguard must be thrown about it to prevent abuses.

The crying need for fats for the manufacture of munitions has resulted in salvaging fats from wild animals and their disposition through local salvage committees in several states. Another wartime contribution has been made through the salvaging of duck and goose feathers for use in sleeping bags, aviators' jackets and similar garments for the armed forces fighting in northern countries. Hunters are encouraged to save the short feathers and down of the birds they kill, which are released to the commercial trade through feather merchants. In addition Ducks Unlimited established a feather collection station at Seattle, Washington, and the Izaak Walton League did likewise at Chicago.

Fur animals are contributing a share to the war program and fur experts of the Fish and Wildlife Service have been appointed consultants to the War Department and the War Production Board. It is anticipated that furs will play an increasing role in properly equipping our armed forces fighting in cold climates. Everyone remembers Hitler's almost hysterical call to the German people to "contribute" fur garments for his freezing troops on the Russian front. The Russians clothed their troops properly from their own abundant fur resources. This is undoubtedly one of the reasons for the success of the Russian winter campaigns.

Aside from the value of their furs, muskrats, opossums and raccoons are also large potential sources of meat. "Marsh rabbit," as muskrat is sometimes called, was highly esteemed by the aborigines. In recent years, clubs and groups have occasionally staged marsh rabbit dinners. Almost invariably the guests enjoyed the dinner but their social prejudices usually prevented them from serving muskrat at their own tables. Nevertheless it is sold extensively



Intelligent and devoted work of wildlife conservationists has made it possible to take photographs like these. The ringneck pheasants in V-formation are eating grain supplied by farmers when the fields are snow-covered. Ducks, quail, geese and other game birds were conserved for esthetic and sporting reasons, but their meat is an important addition to the national food supply



in Washington, Baltimore, St. Louis, Wilmington, and Philadelphia as "marsh rabbit" but without attempt to hide its real name. Through proper publicity, sales could be greatly increased everywhere. Trappers and hunters roasted raccoon and opossum as well as muskrat meat over the coals of the campfire and relished it. Traders and Indians dried the meat for winter food. In certain parts of the country today, particularly in the South, considerable quantities of those meats are utilized, as they might be wherever the animals are found in quantity.

Few other products provide such a large source of proteins, vitamins and useful oils and lend themselves so well to processing for shipment to the fighting fronts as those of commercial fisheries. The entire pack of some species such as salmon is being set aside by the government to supply the needs of our own forces and our allies.

The President and all war agencies have demanded greater efforts to boost the country's food supplies. The commercial fisheries can increase their already great production more rapidly than any other source. Unlike other foodstuffs, the fish of the sea are there to be taken if manpower and equipment are available. To increase the take of commercial fishes and to expedite its handling, processing and distribution, the President designated Secretary Ickes Coordinator of Fisheries to work with the industry and the twenty-one other government agencies concerned with fishery management. Secretary Wickard, when Wartime Food Administra-



American disciples of Izaak Walton bring home an estimated 300 million pounds of "sporting" fish every year. While the war continues their wives will make fewer caustic comments on time wasted in fishing



American commercial fisheries yielded nearly five billion pounds of human food in 1941. Under favorable conditions another billion pounds could be added to this every year

tor, delegated to the Interior Department all problems dealing with the taking, preparation and processing of fish, reserving to the Food Distribution Administration the responsibility for marketing and distribution. These actions go far to insure a high yield of fishery products.

The Fish and Wildlife Service and cooperating states have made considerable progress in developing new sources of foods through the utilization of fishes not normally eaten. Menhaden is a fish taken in large quantities commercially along the eastern coast for fertilizer and fish oils but not previously used for human food. By virtue of a satisfactory method of preparation and canning it has become an attractive canned fish. Large quantities will undoubtedly be used at home and shipped abroad under the Lend-Lease program. This alone may result in the production of fifteen to twenty million pounds of food for domestic and export use. Although long popular in Europe, the common sea mussels of the Atlantic coast have never been marketed in the United States in commercial quantities. Recently discovered methods of preparing them may result in adding 150 million pounds of seafood a year to the national larder.

The Great Lakes fisheries have long been important and several million pounds of common fresh water species, for which there was formerly a very limited market, will go to the armed services and civilian trade this year. More than 200,000 pounds of fillets from Great Lakes herring are now being marketed for the first time and this yield

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NEW CHESTNUTS FOR OUR FORESTS?

Outlook for Breeding Blight-Resistant Chestnuts and Chinkapins for Our Forests and Wildlife

By RUSSELL B. CLAPPER

THE American chestnut was until fairly recent years one of our most valuable forest trees. It covered a vast area extending from northern Ohio to southern Maine, southward into the Gulf states, and westward to the Mississippi River. Its durability and many uses—tannin, poles, posts, ties, and lumber—together with the large quantities of edible nuts that it produced made it invaluable to the farmer, a source of food for wildlife and an epicurean delight to millions of people.

In wartime the nation especially needs chestnut as a source of tannin for the tanning of heavy leathers. Fortunately, dead chestnut trees are furnishing over sixty percent of the vegetable tannin produced in this country today.

During the past fifty years, the Asiatic chestnut blight fungus killed the commercial stands of chestnut. Previously a root disease fungus had destroyed large areas of chestnut in the Southern States. The blight and root rot also killed many of our chinkapin trees. Extensive searches and studies indicate little probability of obtaining selections of pure American chestnuts and chinkapins that will be highly resistant to the blight and root rot. Back of this conclusion by plant pathologists of the Division of Forest Pathology, U. S. Bureau of Plant Industry, Soils, and Agricultural Engineering, are many years of experiments into breeding new chestnuts and chinkapins that would be resistant to these diseases.

Plant pathologists discovered that the several species of Asiatic chestnuts were resistant to the blight organism that was killing the American chestnut trees. The Bureau previously had imported small quantities of seeds of these species and had established test plantings at Glenn Dale, Maryland. In 1909 Walter Van Fleet, who had been breeding chestnuts and other species, started chestnut breeding work for the Division of Forest Pathology. He crossed the blight-resistant Asiatic chestnuts with the American chestnut (*Castanea dentata*) and the Alleghany chinkapin (*C. pumila*). The Asiatic species that he used were Chinese chestnut (*C. mollissima*), Seguin chestnut (*C. seguinii*) of China, and a cultivated form of Japanese chestnut (*C. crenata*). By 1937 the chestnut blight had killed all of the hybrids that had American chestnut parentage.

Since the Asiatic species of chestnuts had shown unusual resistance to the chestnut blight fungus, it was decided that a plant explorer should be sent to the Orient to collect seed from the various forms or strains of these species. In 1927, R. Kent Beattie of the Division of Forest Pathology visited the Orient, and for three years he collected seed from numerous forms of chestnuts in Japan, Korea, and China and shipped the seed to the United States. Seedlings from these introductions were distributed to Federal and State foresters and other co-operators who established numerous experimental plantings, mostly in the Appalachian Mountain region.

Foresters and pathologists are observing these experimental forest plantings, and they are obtaining valuable information on the best methods of establishing the



Grown in close formation, some of the Chinese chestnut trees produce fine, straight trunks



Artificial pollination — paper bags protect both staminate and pistillate flowers of Chinese chestnut from unwanted pollen until the proper time, when selected pollen is applied to ensure fertilization

Asiatic chestnuts and on the types of sites suitable for growing them. This information undoubtedly will be valuable sometime in the future when blight-resistant, timber-type, hybrid chestnuts are available for planting.

Since 1925 the writer has continued the forest chestnut breeding work in the Division of Forest Pathology. In 1930 Arthur H. Graves of the Brooklyn Botanic Garden also began to breed forest chestnuts for blight resistance. The Division of Forest Pathology has aided him in this work. Since 1939 Bowen S. Crandall of that Division, stationed at Athens, Georgia, has been crossing the several species of southern chinkapins with blight-resistant Asiatic chestnuts. The nuts produced by these crosses will be tested for resistance to decays that are causing serious crop losses in some of the Asiatic chestnut plantations in the South.

To breed a new timber chestnut, the writer attempted to combine the excellent growth qualities of the American chestnut with the disease-resistant qual-

ities of the Asiatic chestnuts. In the progress of this work, selections are made continually of the best types of chestnuts to serve as parent trees. For instance, American chestnut trees that appear to have some blight resistance, and Asiatic chestnut trees that display good timber tree form are crossed so that the first-generation hybrids may have these desired characteristics to the maximum degree.

The two species of Asiatic chestnuts most extensively used for crossing with the American chestnut are the Chinese chestnut and the two forms, wild and cultivated, of Japanese chestnut. First-generation hybrids from crosses of these species with American chestnut usually display great vigor. The form of the hybrids is that of the American chestnut, but their resistance to the blight fungus is intermediate between that of the parent species, and the quality of their nuts for eating purposes is likewise intermediate between the parents, although there may be considerable variability. This partial resistance to the blight necessitates backcrossing the first-generation hybrids to the blight-resistant parent tree. Many young hybrids of the first backcross generation are growing at Glenn Dale, and some of these display satisfactory vigor. All of them eventually will be inoculated artificially with the blight fungus. Those hybrids that show greatest blight resistance will be used further in the breeding program. A number of successive backcrossings to resistant Chinese and Japanese chestnut trees may be necessary before satisfactory resistance appears in the hybrids.



(A) Pistillate catkins of the Chinese chestnut usually are first receptive to pollen after the staminate catkins (B) have shed most of their pollen



A flowering, fruiting branch of an everbearing chestnut hybrid, obtained by crossing the everbearing Sequin with the American chestnut

AMERICAN FORESTS

Another species of *Castanea*, native to China, is Henry chinkapin (*C. henryi*). Specimens of this tree with heights of sixty to one hundred feet and straight, symmetrical trunks occur in China. This chinkapin has not been grown long enough and in sufficient numbers in this country for its performance to be determined. It appears, however, to be more susceptible to the blight than the other species of *Castanea* native to China. Mature specimens of the Henry chinkapin have been scarce, and the species blooms approximately two weeks earlier than other chestnut species. The Division of Forest Pathology only recently succeeded in hybridizing this species extensively.

Of lesser importance, probably, for timber-tree breeding are the tree chinkapins of the Southern states and the Ozark Mountains in Arkansas. The largest of these, the Ozark chinkapin (*C. ozarkensis*), may reach an age of one hundred years and form trunks three feet in diameter. Other tree chinkapins are Florida chinkapin (*C. floridana*), Alabama chinkapin (*C. alabamensis*), Margaret chinkapin (*C. floridana margaretta*), and Ashe chinkapin (*C. ashei*). The writer has crossed some of these species with the wild or forest type chestnuts of Japan, and pronounced vigor was evident in the first-generation trees. Unfortunately, all of the native chinkapins are susceptible to the chestnut blight; consequently, the first-generation hybrids must be backcrossed to the resistant parent tree.

The Chinese and Japanese chestnut trees are smaller than the American chestnut; however, because these two species are blight-resistant, chestnut



Eight years old, these first-generation hybrids are a cross of the Chinese and American chestnuts. The flowers are bagged, preparing for intercrossing, to secure second-generation trees



This precocious, everbearing hybrid—a cross between the Seguin and American chestnuts—is only two years old



Luxuriant growth of a trailing chinkapin—made during the first year after a fire. Some shoots bear mature fruit

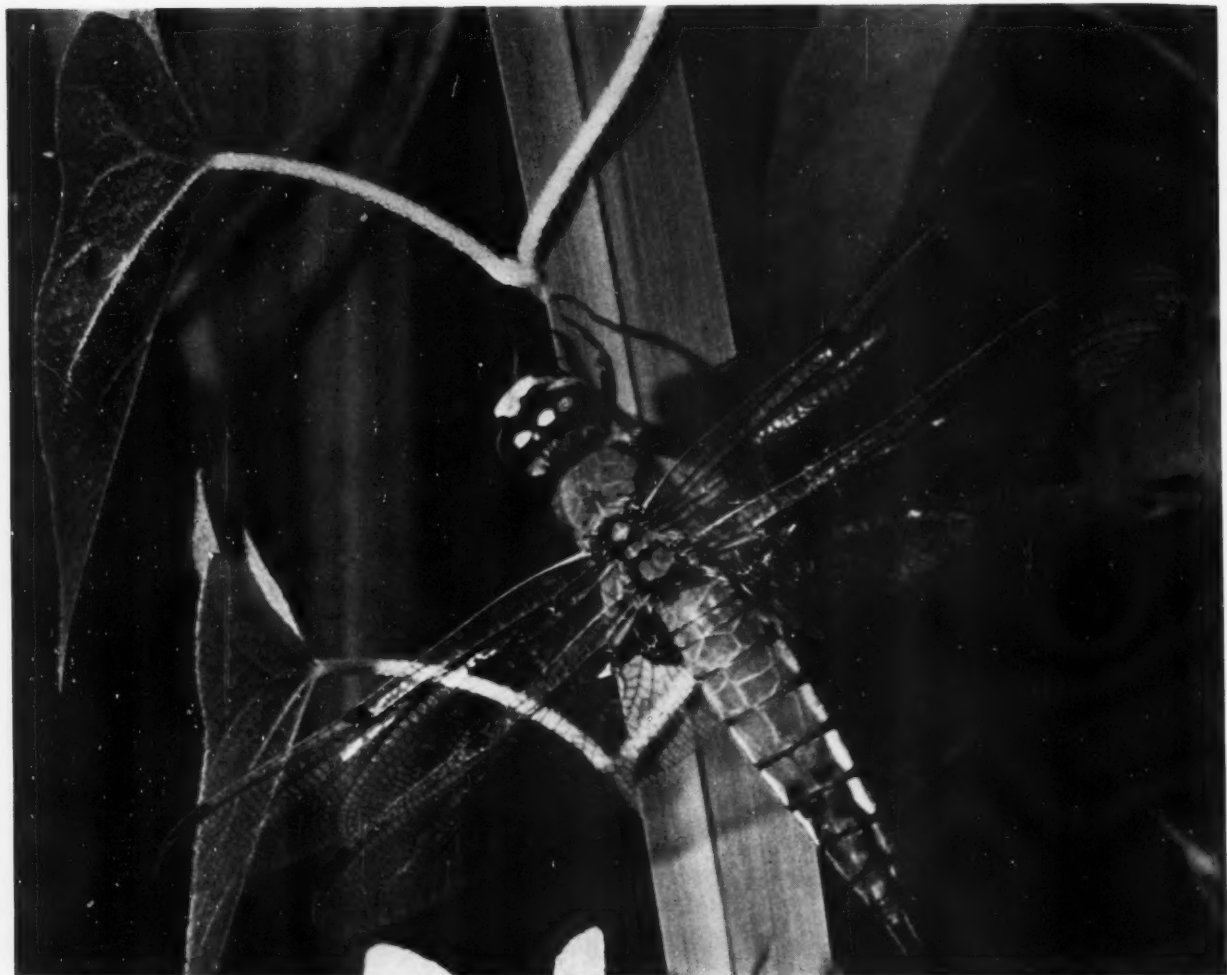
breeders have crossed them in the hope of obtaining vigorous, blight-resistant hybrids in the first generation. The writer's experience with Chinese by Japanese chestnut hybrids produced by him as well as by Van Fleet indicates that the first-generation trees display no marked vigor and their blight resistance is not superior to that of the parent trees.

Forest trees and shrubs are important as a source of food for animals. The disappearance of the American chestnut and the decline of the native chinkapins were calamities to nut-feeding animals as well as to man. A part of the chestnut-breeding program is devoted to the development of blight-resistant chestnut and chinkapin hybrids that will thrive reasonably well on various soils and in various climates and will produce yearly crops of nuts. Such hybrids probably will be small trees or bushes, and the most suitable locations for planting them will be edges of forests and woodlots,

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YOUR FRIEND—THE DRAGONFLY

By EDWIN WAY TEALE



Swamps are the home of these mosquito-hawks, invaluable allies of those who visit the summer woods and streams. Here a dragonfly is shown resting on a leaf of sweet flag. Spending most of the daylight hours on the wing, these insects attach themselves to plants in protected spots to sleep for the night

WHEN woodland gnats swarm before your eyes or you hear the high, steely hum of mosquitoes, think kindly of your friend, the dragonfly. On swift wings, it spends its days hawking back and forth, scooping from the air gnats and mosquitoes and kindred pests of the out-of-doors.

As many as a hundred mosquitoes have been found packed in the mouth of a single dragonfly, and in the space of two hours one of these winged hunters has been known to consume its weight in horseflies. Oftentimes, dragonflies will continue hunting when their

mouths are so packed with a black mass of smaller insects that they are unable to close their jaws. No other insect that I know, with the exception of the meek-appearing, bloodthirsty praying mantis, has so voracious an appetite.

It is this appetite which makes the dragonfly an invaluable ally of those who visit the summer woods and streams. There is still in existence a letter written by an Army officer who saw service on the western plains in 1885. During early summer, at a fort on the Missouri River, he relates, mosquitoes appeared in vast clouds and fell upon

men and horses alike. Smudges burned all night in the barracks and men ventured out on the rifle range only when wearing leather boots and gauntlets and head nets. It was the worst "mosquito year" the fort had known. Then, almost as though a miracle had happened, large numbers of dragonflies appeared, coursing back and forth in "an irregular kind of skirmish line" and making frequent dabs as they captured mosquitoes. A few days later, a majority of the mosquitoes were gone and life became livable once more at the frontier fort.

Paradoxically, in spite of its benefits

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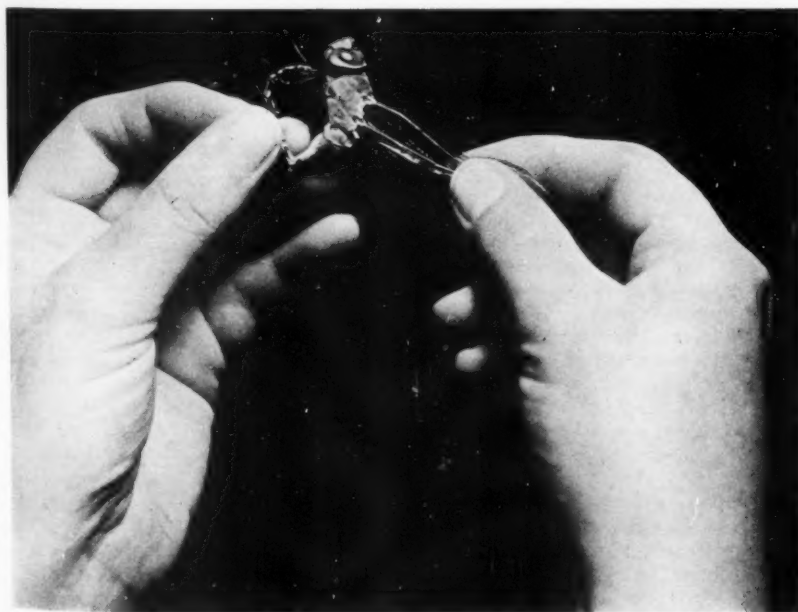
to man, the dragonfly has always been viewed with suspicion and dread. It has been falsely accused of many crimes. Because they sweep back and forth over swamps and stagnant water in their search for mosquitoes and other prey, dragonflies have been accused of aiding snakes and have been called "snake-doctors" and "snake-feeders." In Scotland they are known as "flying adders." Because they circle about cattle and horses, helping the creatures by catching pestiferous flies, they have been accused of stinging the animals and have been nicknamed "horse-stingers". Everywhere they have been termed the "devil's darning needle" and the superstitious of many lands have believed that they sew up the ears of children.

Even in the learned Latin names of the men of science there is reflected this antipathy toward a harmless and beneficial creature. The names of numerous species indicate a connection with serpents and those of others have meanings that range from "the hangman" to "dyed with blood."

Unaware of this almost universal antipathy, the dragonflies of the world have gone on century after century reducing the insect-pest population of their surroundings. For something like a hundred million years they have been engaged in this task. Over the steaming, stagnant lakes of the Carboniferous Age, dragonflies as big as hawks sailed on wings with a span of nearly thirty inches. They were the biggest insects that ever lived. These prehistoric creatures hunted their prey amid fantastic jungles of giant mare's-tail and graceful cycads. The dragonfly has seen the evolution of forests and trees from prim-



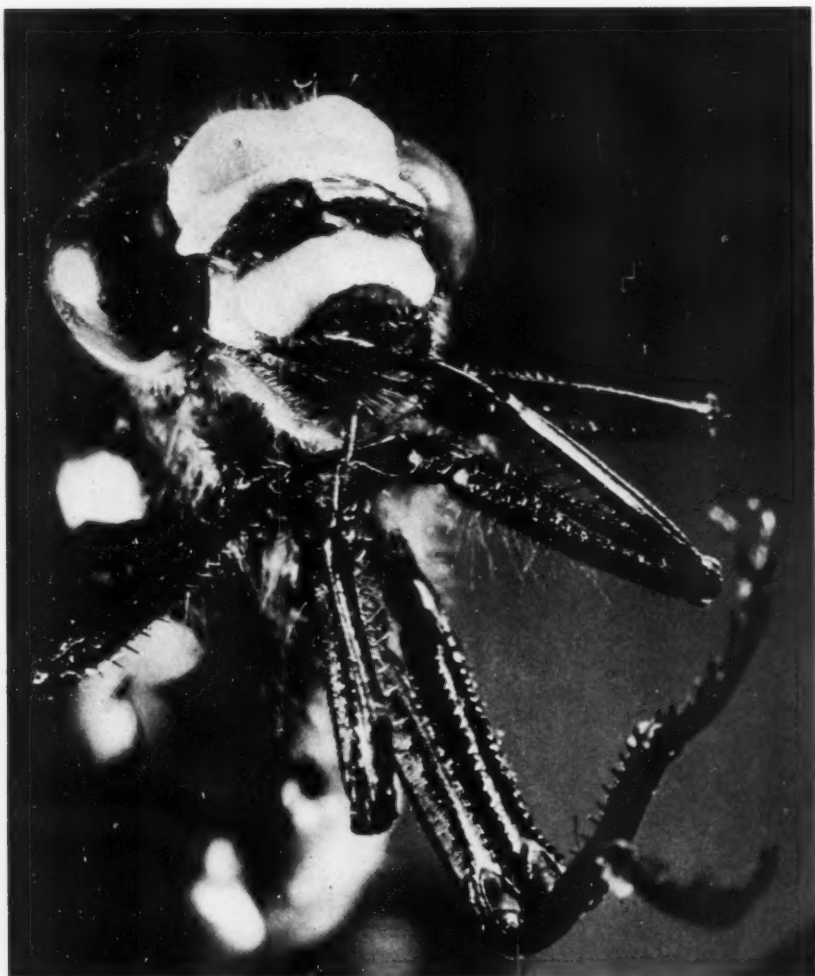
With great protruding eyes, which give their heads the shape of a dumbbell, dragonflies can see in almost all directions at once. With wide jaws and sharp teeth attached to their mandibles, they catch and chew their prey, sometimes cramming their mouths so full of mosquitoes they are unable to close their jaws



itive growths to the most highly developed of modern forms.

Throughout the ages, the mainspring of activity of this pioneer among the insects has been the demands of appetite. Dr. Leland O. Howard, for many years head of the Bureau of Entomology of the Department of Agriculture, tells of one dragonfly which had been chloroformed and mounted. Evidently the anesthetic was insufficient to kill the insect and it revived after it had been secured to a board by means of a large pin thrust through the thorax. In spite of this terrible injury, it ate ravenously

So voracious are the larger dragonflies they will consume parts of their own bodies to appease the pangs of appetite. Here, a dragonfly is beginning to nibble away at the end of its tail, placed within reach of its jaws



Placed well forward under its body and bunched together, the legs of a dragonfly are lined with long spines. When flying, the insect uses these spined legs like a basket, or butterfly net, to scoop smaller insects out of the air. It then transfers its prey to its mouth, consuming it while darting through the air

when flies were placed within reach of its jaws. As long as the food was proffered, it made no effort to escape. The pleasure of eating apparently made it forget the pin which was thrust completely through its body.

Before I learned that such an event is not uncommon, one of the surprises of my life came when a dragonfly I was holding by its wings curled up its abdomen and began munching on the tip of its tail. So great is the craving for food that dragonflies thus try to appease it by devouring parts of their own bodies!

Even before one of these shining insects darts aloft on its initial flight, it has been a friend to man. For a year or more, it has lived as a muddy underwater creature, a dweller in pond or stream. Breathing through gills, it has propelled itself in emergencies by shoot-

ing from the end of its food canal sudden jets of water. These jets drive it forward like a little submarine rocket. I have seen a partially submerged nymph shoot a drop of water more than twenty inches. Attached to its face, the immature dragonfly has a curious extensible under-lip which can dart out like an arm to seize its prey. Like the adult, the nymph is carnivorous, and a good part of its diet is composed of mosquito wigglers.

One winter, when I had nymphs in a small aquarium on my desk, I used to watch them feeding. Their folding under-lips would keep flicking out and back again almost with the rapidity of a chameleon's tongue. In the space of ten minutes, one nymph consumed nearly sixty mosquito larvae. Nobody knows how many wigglers fail to reach their

winged and harmful stage because they helped satisfy the appetite of the nymphs of the dragonflies.

Far more spectacular, however, is the hunting of these "living flashes of light," as Tennyson called the adult dragonflies. They are the ace airmen among all the more than 500,000 species of insects. They can dive like pursuit planes or hover like helicopters. They can dart to the side or even fly backward. The shining wings, on which they ride, are supported by a vast network of veins and they move as many as 1,600 times a minute. How fast a large dragonfly can shoot through the air is still an unanswered question. Dr. James G. Needham, the noted American authority on the *Odonata*, once told me of seeing a dragonfly outdistance a swallow and the Australian entomologist, R. J. Tillyard, timed one of these insects skimming down a narrow valley on a windless day at an average speed of sixty miles an hour.

The way of a dragonfly in picking smaller insects from the air suggests a feat of sleight-of-hand. I have watched it many times. There will be a quick stab of the dragonfly's body and some small hovering insect will disappear. What happens is too quick for the eye to catch. All you see is an empty space where the insect was. It is the bunched and spiny legs of the dragonfly which make this feat possible. They form a living insect net with which the speeding dragonfly can scoop its prey out of the air.

These legs are set so far forward they are used only for clinging and climbing. Paradoxically, a dragonfly has legs but it never really walks. It uses its legs for clinging to some waterside support and as a "food trap" while on the wing.

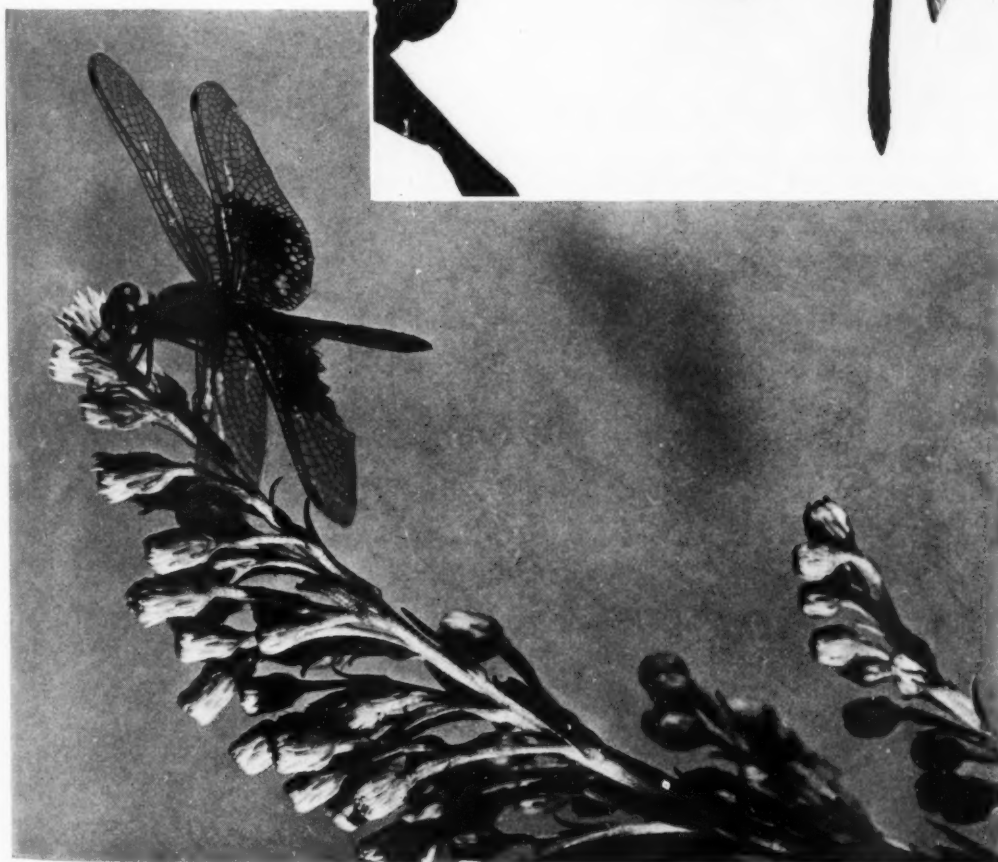
Another invaluable aid to its hunting are the great compound eyes which cover virtually all the upper part of its bullet-shaped head. One of these great organs of sight may contain as many as 30,000 separate hexagonal lenses, more than are found in the eye of any other insect. Bulging outward, these glittering, many-faceted eyes enable the dragonfly to see in almost all directions at once. Keeness of vision and swiftness of wing are the two gifts which permit the dragonfly to sight and outmaneuver its prey.

They also permit it—but not always—to escape from its enemies. The swift and the swallow, the kingbird and the cuckoo, the sparrow hawk and the shrike, all prey upon the dragonflies. Frogs, watersnakes and fish devour them, especially the female insects which descend to lay their eggs. Spiderwebs ensnare smaller species and storms carry even the strongest fliers out over great bodies of water.

One July day, after the passing of a storm the night before, I noticed a green darner dragonfly coming in from over the waters of Lake Michigan in the dune country of northern Indiana. It seemed exhausted and landed so awkwardly it barely upset. When I picked it up it made no resistance and when I freed it, after a short rest, it fluttered to the dunes, barely able to maintain its height. Where had it come from and how long had it been over the water?

Some years ago, after a two-day storm had swept out of the Northwest across Winconsin and out over Lake Michigan, the wind changed to

Silhouette of a dragonfly clinging to fluffy autumn goldenrod after it has finished blooming. Many dragonflies leave the swamps in fall and make long flights over weedlots and upland pastures, capturing flies and other field-insects



Beautiful study of a dragonfly on goldenrod—this time the picture was taken when the plant was just beginning to bloom

the opposite direction. Vast numbers of dragonflies which had been blown out over the water and drowned were washed up on the western shore of the lake. Following the ragged line of driftwood, a scientist counted an average of almost fifty dragonflies for each yard of his advance.

For their own manner of life, the three hundred and more species of American dragonflies are supremely well-fitted to survive. And, fortunately for us, they are invaluable allies that aid us throughout their active lives.



The roof of the jungle looks like a floor from "upstairs." This view is typical of the "chicle bush" in northern Guatemala and the southern Yucatan Peninsula of Mexico

BEATING THE "BUSH" FOR CHEWING GUM

In Guatemala, Amid Ancient Maya Ruins, Trees and Planes Keep Our Fighting Men and Civilian Workers Supplied with Chicle

By E. A. STERLING

WHEN chewing gum, in its various forms and flavors, went out of circulation for a time, we accepted the situation with a regretful shrug and rightly blamed it on the war. We also were reminded of the many things we have taken for granted as always being where we could get them when we wanted them — part of our industrial organization and way of life we are determined to preserve. Perhaps few of us realize that chewing gum comes from trees, but we know that we want it and will get it back.

We have learned a lot about geography from the war. Particularly are we being given a stiff lesson in where everyday things come from, how they are made, and how they reach us—or did. It might be that we became indifferent when every cross-roads store had more things from more places than millions of people in other countries even knew existed. When, with the outbreak of war, we could not have durable goods that required essential metals, the reason was obvious and we gladly nursed along the

old refrigerator and family car. Shortages of some other things were not so clear, however, and we still have a lot to learn about the origin, processing and transportation of foods and luxuries we can no longer take for granted.

Chewing gum is one of the smaller items of American origin which, by universal use, holds high rank among the many things we do not want to do without. It is not strictly a food, a luxury, or an essential war material. Yet it occupies a unique place in American

life that nothing can replace, and this entitles the armed forces to all they need. The civilian supply, temporarily curtailed, is not likely to become so scarce that a pack of chewing gum will be a fair trade for a pound of coffee.

Chewing gum is refined chicle from the latex of the sapote tree, *Achras sapote*, flavored and sweetened to suit our taste. The usual supply of some 20,000,000 pounds a year comes mainly from the tropical jungles of Central America and Mexico. The finest quality is found in northern Guatemala, in parts of Petén Department, which is a political division like a state or province. The sale of chewing gum in the United States in 1941 was approximately 140,000,000 boxes, each containing twenty five-cent



One of the last strongholds of the Mayas in southern Yucatan—the ancient town of Flores, on Lake Peten-Itza. There is no transportation outlet except by plane or mule trail



packages, which adds up to 2,800,000,000 five-stick packages, or 14,000,000,000 sticks. This is a lot of gum to distribute as a \$140,000,000 retail business. Someone else can figure out how many times it makes American jaws wag, and the number of tons stuck under seats in movie theaters.

A working knowledge of where chewing gum gets its start was gained from a survey of the chicle resources of Petén made in 1942 and during the dry season of 1943 for the Chicle Development Company. In relating this experience it is a temptation to indulge in a double feature story, for the jungles of Petén cover the southern part of the lands once occupied by the Maya civilization of 1,500 years ago, while long before that other peoples left obscure traces as old as the Egyptian dynasties.

The political headquarters and focal center of travel and business in Petén is the famous and unique town of Flores, situated on an island in twenty-seven-mile-long Lake Petén-Itza. This island city was one of the last strongholds of the Mayas. Cortez was here after his conquest of Mexico. Within a few minutes or a few days from Flores, depending on whether travel is by plane or mule trails, are found many Maya ruins, including early temples at Uaxactun which may go back to the second century A.D. Some of the massive structures erected on pyramids at Tikal still stand high above the encroaching jungle. Tikal was once the largest city of the Old Empire, with a population estimated at 300,000. Now it is barely a village. From the ruins of community centers and house mounds scattered through the jungles, it is thought that

A fine "high-bush" sapote tree that has been tapped only twice

what is now Petén, with an area of 9,000 square miles, may have once been populated by 3,000,000 people, as compared with about 10,000 today. Just who these people were and what happened to them after the Toltec conquest in the eleventh century is largely a mystery.

There was once a scientist employed on chicle investigations who became so engrossed in Maya history and spent so much time poking around in old ruins that he lost his chicle job. The fascination is easily understood, for not only the ancient Maya country but all of Guatemala is intriguing. It is a country of great contrasts, of charming, cul-

usual sight among the automobiles on Guatemala City streets. Back of it all is one of the best educational systems in Central America, a quinzal monetary unit on full par with our dollar, a stable government and sound business conditions. In variety of natural resources and in tourist attractions of scenery, people and history, Guatemala has much—now and for the future.

Far to the north, in the jungle, is where the gum producing sapote trees grow. To get there the best starting point is Guatemala City, comfortably reached by Pan American plane from Brownsville, Texas, via Mexico City—

much better left to the imagination. It is more comfortable to take a jungle trip by remote control, via the pages of a good book, but it is no great hardship or danger to health,—if properly prepared,—to indulge in the real thing. The jungle “bush” and the Canadian “bush” have little in common, except that both are wild country where men are on their own resources.

The jungle forest has many interesting and complex features. Left to itself it will be made up of the trees and other plants best able to adapt themselves to conditions. Some will be dominant and prevail by reason of size, wind



Native homes on a village street of Carmelita, Guatemala, near the jungle landing field

tured people and unspoiled native Indians, of ox-carts and automobiles, of primitive, dirt-floor huts and cocktail bars.

The lush Pacific coastal plain and fertile valleys grow everything from sugar cane and cotton to bananas and other tropical fruits. The uplands grow northern crops like potatoes, wheat and corn, and, as one of the principal products, coffee that is something to dream about. In the mountains there is grazing—and sturdy people who are said to be afraid to go below 6,000 feet elevation. Hand woven woolen blankets and cotton cloth in bright colors are common products; while to the public markets in Guatemala City, Quezaltenango, and other centers the natives bring incredible loads of varied products long distances on burros, carts and on their heads. An Indian woman, balancing a watermelon on her head, is not an un-

usual sight among the automobiles on Guatemala City streets. Back of it all is one of the best educational systems in Central America, a quinzal monetary unit on full par with our dollar, a stable government and sound business conditions. In variety of natural resources and in tourist attractions of scenery, people and history, Guatemala has much—now and for the future.

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about twenty-four hours from New York. This modern city of 165,000 people is on a broken plain near the head of a mountain valley at an elevation of nearly 5,000 feet. It is 160 miles from Puerto Barrios, on the Bay of Honduras to the east, and seventy-five miles from the Pacific, behind a range of cone-shaped volcanic peaks to the west. Rising abruptly to an elevation of 12,000 feet are broad mountain ranges to the north. These drop off sharply to the plains and broken hills of Petén. It is beyond Flores and the headwaters of the San Pedro River, 250 miles north of the city, that the best chicle “bush” lies.

resistance, and ability to compete with other dominant species; others will be suppressed and hold only a minor place in the forest cover. Each—the strong and the suppressed—has its relative role in the play of forces that produce the ultimate climax forest. We commonly think of the jungle as composed of many species, but actually the chicle bush is made up of comparatively few large dominant trees, of which sapote, caoba, ramon, mahogany, cedar and some species of ficus are the most common.

The Petén chicle bush included in our survey comprised about 3,700 square miles. It is not all productive bush, and one purpose of the survey was to determine the workable areas and the comparative productive capacity. Three very broad types of number one, two and three bush were defined, on the basis of the tappable trees an acre and the



Loading 150-pound bags of chicle in a DC2 plane at Carmelita for the flight to Puerto Barrios

general condition resulting from earlier tapping.

The chicle producing sapote tree is also known as sapodilla and is so described in some of the older literature. It is a broad-leaved evergreen of the *Sapotaceae* family that often grows to a height of 100 feet. Its wood is hard and durable and certain individual trees produce an edible fruit. The natives claim to recognize distinct red and white varieties and sometimes a *morado*, meaning blue or purple, but they are hazy on descriptions while not always sure of identifications. The trees are

probably all the same species, *Achras sapote*. One authority, Hummel, in 1925, from investigations made in British Honduras, described the "female sapodilla" as the best latex producer, with large edible fruit, and the "crown sapodilla," very similar, as the second best. Two others, the "male sapodilla" and "chicle bull," produce little or no latex and the fruit is inedible.

On young trees ten or twelve inches in diameter, the bark of sapote may look like that of a white ash. On the older, larger trees it resembles that of hard-barked white oak. There is wide varia-

tion on different sites, the high bush trees having clear lengths up to fifty feet or more and the low bush much shorter trunks below the crown. Large supporting roots help make the trees wind-firm, which is an essential for survival in the shallow soil over limestone rock where the sapote grows best. Other dominant trees of caoba, ramon and ficus have large buttressed bases that give wind resistance against the violent storms of the region; while all large trees that have retained a place in the climax forest must have the capacity to

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An interior view of the DC2 plane, loaded with its cargo of chicle, taken at about 8,000 feet

AIRCRAFT LUMBER

By ARTHUR W. PRIAULX

FOR more than two years, the finest and most valuable trees from the mountains and hillsides of the Pacific Northwest, after careful selection and milling, have been going to British aircraft plants to be shaped into parts for bombers and other warplanes. The new and now famous Mosquito bomber, fastest of the British airfleet, is built almost entirely of wood—plywood over a frame of spruce.

According to recent reports, one-third

the weight of all British aircraft—fighters, bombers, pursuits and transports—is wood, a substantial part of which comes from the forests of western Washington and Oregon. American aircraft engineers, starting long after the British, are also turning to wood, and to supply the needs of our own air arm is the big production job facing the Northwest lumber industry in 1943.

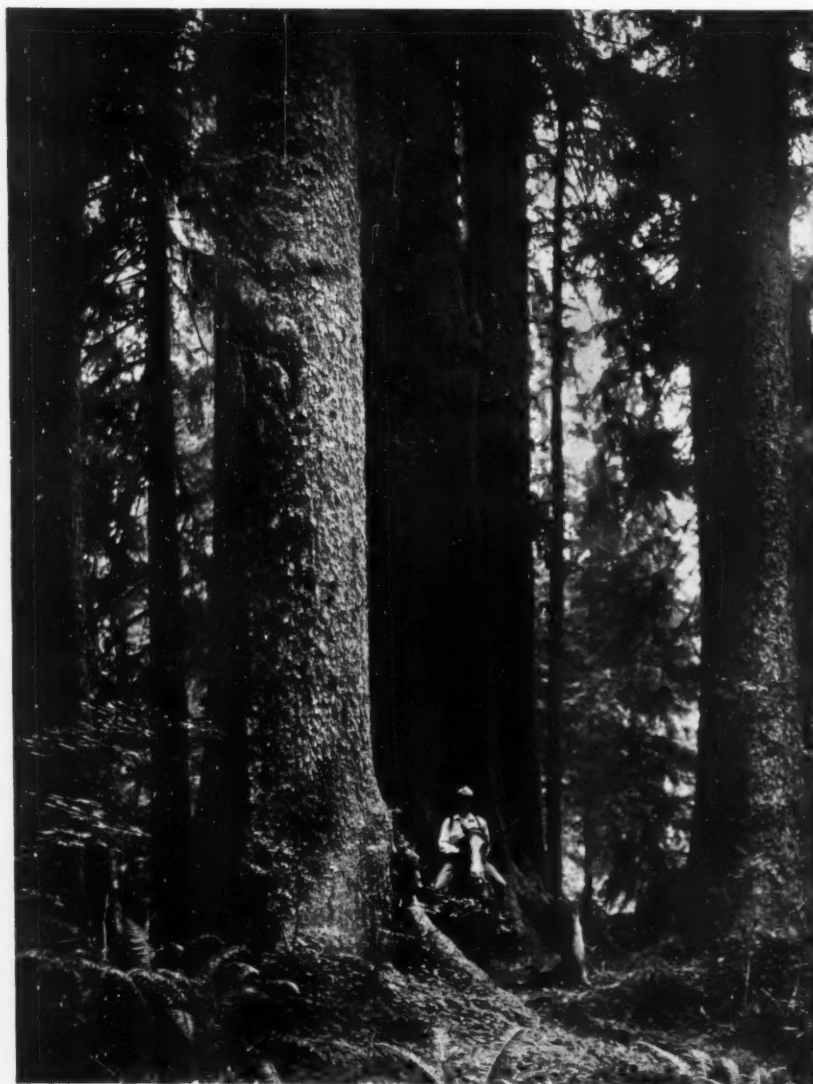
What is aircraft lumber? Reduced to simple terms, it is the best clear lumber

obtainable from Sitka spruce, hemlock, noble fir and Douglas fir, prized trees of the Pacific Northwest, and from yellow poplar of the East. It comes only from the deep, clear portion of the log, right under the bark layer. Since the strength of wood is governed to a considerable extent by the nature of its grain, aircraft lumber must be straight-grained, with a divergence of not more than one inch in every fifteen inches. Naturally, it must be free from knots and blemishes.

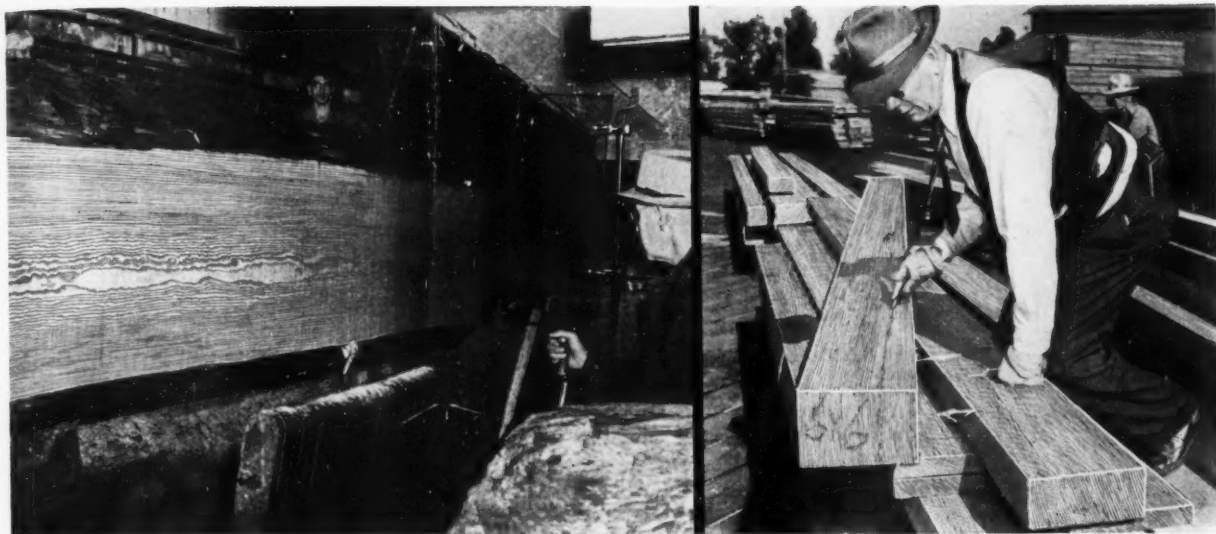
Not every log will make aircraft lumber. For one thing, the number of rings per inch will vary with the same wood species, depending upon the tree's growth history. And even when a log has been marked for possible clear, strong lumber, only a piece or two may ultimately get past the strict inspection required. About twelve percent of logs cut show indication of making aircraft grade. Of these about ten percent make aircraft lumber. This means that less than one percent of the lumber cut today (five percent for spruce) has any chance of joining the air corps of the British or American services.

Total production figures required by our own aircraft factories and those of our British and Canadian allies are a military secret, but needs run into millions of feet each month.

How much wood from Pacific Northwest forests is in bombers, fighters and transport planes is a question not easily answered, due chiefly to the fact that the transition from metal to wood in most plane factories has been so rapid under the pressure of production requirements that figures are obsolete by the time they are tabulated. Sufficient to say that airplane engineers, especially Americans, once prejudiced against the use of wood, now are its boosters. Wood structures, for one thing, have a higher strength-weight ratio than metal structures. As an example, a properly designed wood fuselage weighs less than a metal fuselage, the same load factors being considered in both. Also, wood possesses greater shock resistance than



Sitka spruce of the Northwest, prince of aircraft lumber trees



Wood for fighting warplanes must be straight-grained to pass rigid inspection by flight experts

metal. And it is more easily worked.

An RAF pilot on tour of American plane factories recently explained why British airmen prefer wood propellers under fire and when the pressure is on. He said, "We like props of wood because they stand up. Much of our flying is done from rough fields in actual combat. When a rock hits a metal prop it makes a dent, which soon develops into a fatigue crack and at some unexpected moment the metal prop explodes. When a rock hits a wooden prop, it makes a dent, but that is the last you hear of it. No fatigue cracks, no exploding prop when you may need it most."

The young RAF pilot had lots more to say about wood. The ground crews

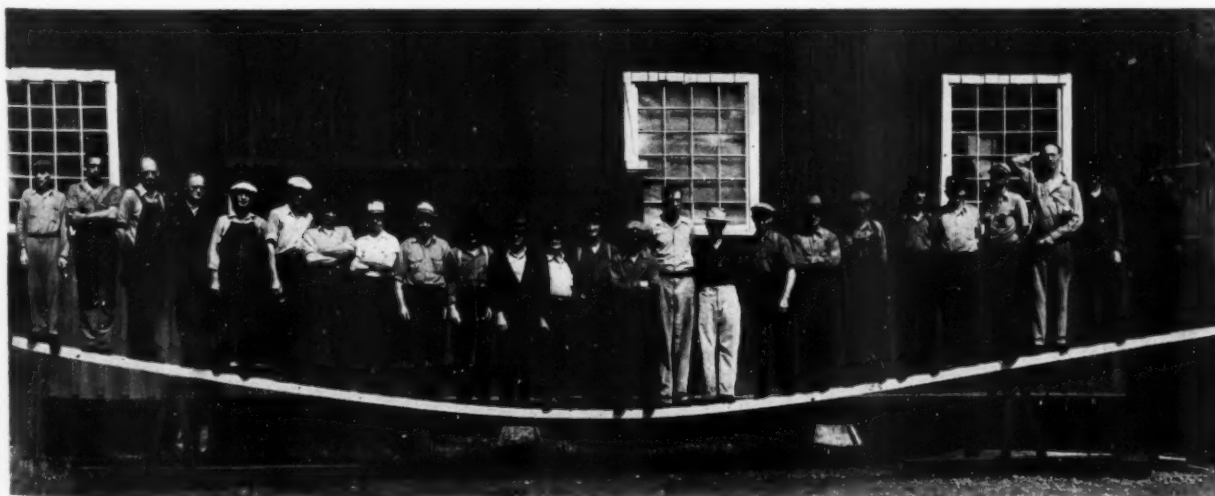
like the wood jobs, he said, because when a bullet pierces a wood wing or wooden fuselage, it makes a hole that can be filled in with a plastic wood of known density, and polished in a jiffy. Not so with metal planes. Repair of bullet holes is almost a major operation, consuming lots of valuable time. In a fighting ship where balance is everything and has a direct correlation of maneuverability, a few extra ounces of repair metal might throw the plane off.

In actual combat, wood airplanes have proved to be more resistant to gun-fire damage. There is no extensive tearing, as is the case when metal is pierced. Even when damage is great, repairs are quickly made. The tools required are

simple and the materials—usually lumber, plywood and glue, perhaps a few small nails.

For every flight of bombers that carry their loads of destruction into Germany and occupied Europe, highly trained ground crews are necessary. Loggers who supply mills in Northwest communities where aircraft lumber is cut are full-fledged members of the ground forces of the RAF. They start the vitally needed lumber on its way to war in the air. And it is no easy task.

Ask anybody in the sawmills where aircraft lumber is being manufactured what the job is like. The sawyer, edgeman, or re-sawyer will likely answer, (Turn to page 363)



The strength required of aircraft lumber is demonstrated here in this Douglas fir plank



Manitoba wild rice stalks are tall and the grain deliciously flavored

WILD RICE is the most glamorous—and the costliest—of all grains. For years the food of mallards and Indians of the North Country, it is finding new popularity in cities and towns far removed from the shallow lakes where it is harvested. Boiled as dessert, milled as flour, or ground and used as porridge, it is noted for its delicious flavor, and there are many who regard it as possessing some medicinal properties. Sportsmen, of course, have long used it as stuffing for wildfowl.

This is only natural, for ducks, particularly the mallard, feed extensively upon the wild grain. They obtain it chiefly in the mud of shallow water where the matured seeds have fallen. The wood duck feeds on the flowers and stems, and the leaves of mature plants are taken by wild geese.

Only meagre information is available on the annual wild rice crop in the United States and Canada, but Minnesota, claiming some 30,000 acres of this grain with a yield up to 500,000 pounds, probably produces more than any other state. In Canada's province of Mani-

WILD RICE

Once Food of Ducks and Indians, Manitoba's Glamorous Grain, Now Machine Harvested, Finds New Popularity . . .

By ORMAL I. SPRUNGMAN

toba, a peak of 150,000 pounds has been reached.

It is in Manitoba's shallow lakes that the Ojibwa Indians set up their teepees in the harvest month of September and paddle or pole their canoes through the rice beds to tap off the ripe heads. Here also, at Lac du Bois, lives Howard Williams, who for the past twenty years has been working with the Indians at harvest time, and whose mechanical genius has revolutionized the romantic though ploddy redskin manner of gathering, parching, "dancing" and winnowing the grain. Williams probably knows more about wild rice and its harvest than any other living person.

Reaching ten or twelve feet in height, wild rice is particular about the kind of water it grows in, according to Williams. It may be neutral or slightly on the acid side, but must not have an alkaline content. Its depth may range from four inches to four feet, and a sluggish current of around a mile an hour is preferred.

In autumn, the ripe seeds fall into the water, sink and are buried in the soft

mud where they remain dormant all winter. In spring, the first leaf to appear is a "floating leaf" which trails on the water surface. This dies off when the main stem follows in June. So important is this floater that should heavy rains raise the water level and submerge the leaf before the main stem has reached the surface, the plant will not reseed. Williams believes this may explain planting and rice crop failures.

One seed can produce several flowering stems. Cross fertilization is assured by the female flowers developing before the male flowers on the same stalk emerge from the sheath. Pollination is by the wind. Early in September, the seeds ripen from the top down on heads fifteen to twenty-four inches long, and the harvest follows shortly after.

The freeze-up locks the rice plants in ice, and in spring, when the freshets raise the water level, the ice lifts and tears up the rice plants by the roots, the straw being cast up on the shore. Thus does Nature clear the rice beds of the old growth each year. In fact, the disturbance of the mud bottom by this



Howard Williams, who revolutionized the romantic Indian method of harvesting and processing wild rice, sowing a new crop

AMERICAN FORESTS

wholesale tearing up of the roots is equivalent to cultivation and actually assists the germination of the seed.

The primitive Indian method of harvesting is still being practiced in Manitoba's rice beds. An Indian seated in the bow paddles or poles a canoe through the rice while a companion in the stern draws the plants over the canoe with a round stick, gently tapping the heads with a similar stick held in the other hand. He then repeats the process on the other side, thus drawing the plants alternately from right and left as they progress. The ripe seeds drop off into the canoe.

Since the seeds ripen over a period of about three weeks, the gathering is repeated at ten-day intervals from the same plants. Much of the seed is knocked off into the water and many heads are missed. Thus seeding is always ample for next year's crop, for it is doubtful whether more than fifty percent of the crop is gathered by the Indian method.

To speed up production, Howard Williams and the late W. Holliday developed a harvesting machine which resembled an invention of Superman himself. A Ford V-8 motor geared to paddle wheels on the sides is mounted on a flat-bottomed punt of shallow draft. The motor also furnishes power to operate two binder-like wings which slowly revolve as the boat progresses, drawing the rice heads over a trough into which are knocked the ripe seeds. Although ample seed falls into the water, Williams estimates that his homemade contraption is effective in harvesting from eighty-five to ninety percent of the crop. Like the Indians, he covers the same beds only three times during a season.

The Ojibwas in the North still follow ancient hand-me-down methods of preparing wild rice for human consumption. It is sacked and carried to the parching fires, usually attended by old Indian women. Then it is dumped into sheet iron troughs resting on the fire and kept in motion by means of hoe-like utensils with long wooden handles. Parching requires from twenty to thirty minutes over a slow fire, and it is this process which loosens the hulls.

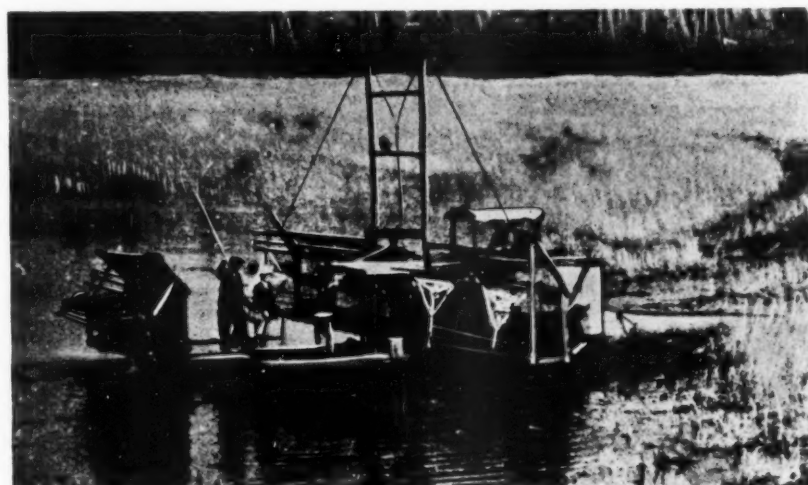
When parching is completed, the rice is transferred to the "dancing pots." These are clay or concrete containers into which half a bushel of parched rice is poured at one time. The pots are large enough for an Indian to stand in and shuffle about with his feet. Holding on to a tree trunk or "bucking beam," he works the rice with his feet until the hulls are torn away from the kernels. This process is called "dancing the rice."

After this, Indian girls scoop the rice into birch bark trays and toss it into the

(Turn to page 364)



Williams' homemade rice-harvester. Revolving slats in the wings knock ripe seeds into troughs where they are readily collected



In action, the "contraption" does the work of many Indians, collecting by hand. Ninety percent of the rice crop is harvested



Storage platform near Williams' home in the Lac du Bois rice beds is cleared Saturday nights during harvest season for native dances



EVENSONG

BY GERTRUDE PETTIT SELBY

Far in the north
I heard this pine,
Singing a psalm
At sunset time.

Then darkness came,
And from the sky
The stars shone out
Like lanterns, high.

And I could hear
Throughout the night,
That silent psalm:
"God is my light."

Editorial

The Axis and the Ax

INFORMATION regarding the exploitation by the Axis powers of forest resources of the countries under their heel is exceedingly meager. From time to time reports seep through but they are haphazard and incomplete. Piecing them together, however, there appears to be no doubt that the Nazis are applying the ax to the forests in occupied countries with the same ruthlessness they are applying the sword, the black-jack and the plunder-bag.

As regards Norway, for example, information has just been received through the United Nations Information Office in New York reflecting the forest devastation that is being enforced upon that brave and unconquerable little country. The report comes from Oswald Dutch of European Correspondents, Limited, London. Mr. Dutch writes:

"A single newspaper in Europe has dared to draw attention to the reckless exploitation of the Continental forests by the Nazis.

"The Norwegian paper *'Arbetaren'* wrote recently: 'We may mention as an example of the ruinous demands made by the National Socialists on the forest owners in North Norway that in various places every farmer has been ordered to deliver from 100 to 150 cubic metres of firewood for the use of the Germans in addition to the quantities previously requisitioned by the local supply boards. In the Commune of Maelselv no less than 120,000 cubic metres of firewood have been requisitioned for the German garrisons, in addition to the quantities requisitioned for civilian Norwegian consumption and the enormous quantities of timber ordered for the German fortifications. Norwegian forest inspectors are extremely anxious concerning the future of the forests in Northern Norway should this ruinous exploitation continue for any number of years. The Germans show no consideration for the welfare of the forests, and the growth of new trees in the forests at this high altitude is very slow. It is chiefly the most valuable forests which are exploited in this way and those easiest of access.'"

"A few weeks later a Norwegian in-

spector of forests, Liaklev, reported that in Oestfold district, in the 1942-43 season, 170,000 fathoms of firewood had been cut by order of the Germans and that 200,000 fathoms had already been ordered for the 1943-44 season. These statements leave no doubt that this uneconomic exploitation which was already considerable in the preceding year will be increased in the current year by at least twenty percent."

Mr. Dutch goes on to point out that among the countries dominated by Germany only Norway, Poland, Yugoslavia, Rumania and Slovakia have any considerable forests. Consequently, the Nazis, while conserving the forests of the Reich proper as much as possible, have fallen upon these forests in reckless disregard of the future needs of the peoples concerned and the world in general.

"Here," he writes, "all scientific methods of forestry have been thrown overboard, whole forests cut down regardless of consequences and no measures taken to ensure reforestation and the proper care of the young plantations. The ruthless cutting down of whole forests is not only a danger from the point of view of the timber supplies of the world; a further consequence is a lowering of the level of the underground waters in the surrounding country. The bare, denuded mountains of Bosnia and Dalmatia, whose woods were felled by the Venetians throughout the 17th and 18th centuries, are an example of the effects of desiccation on the fertility of wide stretches of country."

To most Americans, the liquidation of forests in European countries may seem remote and impersonal. It is not. A world shortage of wood at the close of the war will raise problems not unlike those involved in a world shortage of food. It is an accepted fact that the Allied Nations must be prepared to provide the starving people of occupied countries with food when the war ends or there can be no continuing peace in the world. The burden will fall mainly upon the United States. American leaders are giving much thought and study to this problem.

A corollary problem—less critical perhaps—will be that of providing adequate housing and fuel wood for people of Nazi-plundered countries whose homes and cities have been destroyed or sacked and whose forests have been annihilated. Here, too, the burden will fall mainly upon the United States. American leaders are not giving much thought to this question or to determining the extent to which the forest resources of this country can help solve the housing and reconstruction problems of post-war peace.

Our own post-war reconstruction is going to levy tremendous demands upon our own forest resources. In point of family dwellings alone the Commerce Department estimates that already there is in sight a post-war demand or need for four and one-half million homes. As the war continues, destruction abroad and cessation of civilian construction at home continue to force upward a potential world need for lumber and other forest products in the building of a durable peace.

Without liquidating or depleting its own growing stock of forests, can this country provide wood as it is planning to provide food for the peoples of undernourished and under-housed countries devastated by the Nazis? This is a question vital to our own material needs and to a successful world peace. After reasonable domestic requirements are taken care of, what balance, if any, will remain that we can safely export without jeopardizing the nation's growing stock of wood, which obviously we must guard intelligently and zealously?

Here is one of many timely and world-reaching questions which The American Forestry Association is undertaking to clarify in its proposal of a forest appraisal of the country's forest resources as they are being affected by war drains, and as they will inventory at the close of the war. This is common-sense preparedness for a very near future in which the fate of the world may well turn on intelligent and factual handling of natural resources, of which forests are among the foremost.

YOUR SHADE TREES:

Victory Gardens in Trees

By L. E. MANNING

IN THESE days when the most ornamental of our female citizens have suddenly blossomed into overalls and slacks and invaded factories and ship-yards, it should be no surprise to learn that shade trees, too, can be productive as well as beautiful. There come instantly to mind such old-fashioned things as farmyards shaded by sugar maples tapped for sweets in April, or by huge, handsome cherry trees or even fruit trees such as apples and pears.

All shade trees should be handsome, fairly free from insects and diseases, hardy and tolerant, and food-producing trees in particular must be clean in habit — that is, not dropping branches or fruit too freely. This is the ideal for private land, but on city streets it must

be at once admitted that no tree that produces fruit is desired, for fear of vandalism. This restriction automatically confines our subject to lawns, back-yards and country places — which is still scope enough to be worth careful consideration.

The sugar maple is one of the handsomest trees that can be planted. It has few faults, except a distaste for the impure air of cities and a root-greediness which, in old age, tends to kill out lawn beneath its branches. It is a fine shade tree without considering its sugar, but unfortunately it takes many years to get into production and it is fervently to be hoped that the war will be over

before small trees planted now would add much to the sugar supply of the country.

However, our ancestors used another sugar tree—the sweet birch (*Betula lenta*), — which is much less generally



Our native chestnut,—queen of the fields. Formerly a prolific nut-bearer but now almost a memory in the American landscape, due to the ravages of the chestnut blight disease



Sugar maple with its flowing sweets is a Victory tree, combining beauty and utility, for sugar means energy in the conduct of war



Chinese chestnut in a native village. Blight-resistant, hardy and a rapid bearer, it is replacing here our nearly extinct American tree

known. Also called cherry birch, it produces the flavoring used for birch beer of olden days. A fine pyramidal, strong-limbed tree, with brown bark, smooth and marked vertically instead of with the commoner horizontal birch markings, it grows perhaps seventy-five feet high. It is fine as a lawn tree, very tolerant and free of most insects and pests. I once tasted a small piece of the sugar, boiled down the same as maple, and while it is quite different though almost as delicious as maple, it is slightly less sweet to the taste.

In true fruits, probably the best shade tree is the sour cherry. This is more hardy and disease-resistant than the sweet cherries, being as a matter of fact a different species altogether. It is majestic, ornamental and certainly produces large crops of fruit ideal for canning—so that its place as a Victory Garden shade tree would seem obvious. The fact is, of course, that birds eat most of the fruit, because they get up earlier in the morning than most humans. But considered as a shade tree this has one advantage—there is comparatively little litter beneath. Either you pick the cherries or the birds do, and few fall, in either case.

Apples—some varieties—make fairly good shade trees. Baldwin, for instance, is a fine substantial tree and holds apples late, so that lawn-mowing is all over before any picking is to be done. As a shade tree, however, there is needed more than the usual amount of spraying and the tree is not really as handsome as one would wish. Pears, too, are long-lived and make vigorous trees—with about the same objections and recommendations as apples for our purpose. Plums are too prone to disease and insect attack, and peaches too small in stature to be seriously considered as shade trees.

Special mention must be made of the mulberry. Though a smallish shade tree, only around thirty feet high, its spread is as great or greater than its height so that it provides plentiful shade. It is rather weak-limbed, but to offset this is its exceedingly rapid growth. And its fruit, though too sweet and insipid for some tastes, is very attractive to birds. They come in droves and in great variety, so that during the three to four weeks the mulberry is in bearing, it might be said to be filled with living flowers. There are several improved varieties, notably the "New American" and "Downing," which are more tasty and, provided one has the heart, the fruit can be taken from the birds and put to human use without trouble.

But of all combination shade and food trees, perhaps none equal the nut trees for outstanding beauty and real production of food. There are three families which are hardy in most of America—walnuts, hickories and chestnuts. The last named would have led the list twenty years ago, but our American chestnut is practically extinct now. The blight-resistant species from Asia has good nuts, but they are not nearly so large and handsome as was our native chestnut. The best is probably the Chinese chestnut (*Castanea molissima*), but it grows more like an orchard tree—rather small and bushy. Nevertheless, it is distinctly worth using and the grafted varieties particularly bear at an extremely

fairly hardy English,—properly "Persian" walnuts, chiefly available in grafted form, which are good-looking trees, though not so outstandingly handsome as either of the above, and which yield, of course, the well-known walnut of the dessert table.

The hickory family must be included first for the hardy forms of the pecan (*Hicoria pecan*) which is moderately hardy and makes a fairly handsome small tree in the North. But much more outstanding is the eighty-foot, princely pyramid of shagbark hickory—one of the hardiest of nut trees. Extremely free of disease, tolerant of any fairly well drained soil, its nuts have a unique flavor. Again, although the wild species



The rich yield of the black walnut (left), and the hickory (right), contributes definitely to the food supply of a nation at war

precocious age. A five-foot tree might bear this fall, for instance, if set out this spring.

Much handsomer trees, however, are the two grand American natives, black walnut and butternut. These are hardy and attain majestic size and graceful shape. The shade is not too dense, but light and pleasant. The yield of nuts,—again, particularly in grafted varieties, is quite extraordinary and a small nursery grafted tree often bears in two years from planting. Both kinds are nearly trouble-free, tolerant as to soil and ideal from the growing point of view. The only problem would be the matter of collecting the nuts as they fall, since they would otherwise litter a lawn. But merely picking up food should not seem too onerous a task these days! Though the meat is difficult to dig out of the nut, one of the newer grafted varieties (Stabler) actually falls out in two halves upon cracking. There are also

may be hard to crack and extract, there are new grafted forms which are both thinner-shelled and with larger meats, more easily removed.

To sum up, the following table lists the Victory Garden shade trees as rated in their order of merit:

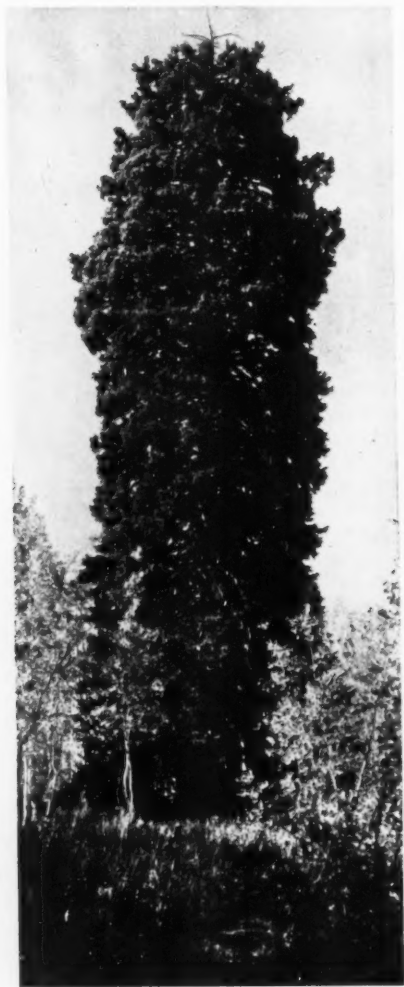
	Shade	Food
1. Shagbark Hickory (grafted forms)	good	good
2. Black Walnut (Stabler)	good	good
3. Sour Cherry (Montmorency)	good	good
4. Butternut	good	fair
5. Mulberry (Morus alba)	fair	good
6. Sweet Birch	good	fair
7. Sugar Maple	good	slow
8. Chinese chestnut	fair	good
9. Apple (Baldwin)	fair	good

So select the varieties best suited to your needs, and plant for shade—for food, and for Victory!

Tree Trails . . .

Across America in Search of the Rare and Unusual

AS THE search for the largest specimens of American trees enters its third year, new and important discoveries have been made. Several mammoth kings have surrendered their crowns to heretofore unknown giants among their clans; tree tribes for which there have been no chieftains are at long last represented in the hall of fame for big trees of The American Forestry Association.



New champion Engelmann spruce in the Cache National Forest, Idaho

One of the most outstanding trees to lose its throne is the giant Engelmann spruce, nineteen feet, four inches in circumference, and eighty feet tall, standing in the Flathead National Forest of Montana. It gave way to a monarch found in Bloomington Canyon, Cache National Forest, in Idaho. Discovered and reported by United States Forest Ranger Jay B. Hann, with headquarters at Paris, Idaho, this new king of the clan *Picea engelmannii* has a circumference four and a half feet above the ground of nineteen feet, eleven inches. It is 104 feet tall and has a crown spread of thirty feet. It is estimated to be 300 years old.

According to C. N. Woods, regional forester of the Intermountain Region of the Forest Service, with headquarters at Ogden, Utah, discovery of this giant resulted from the policy of "encouraging national forest officers in the Intermountain Region to participate in your campaign to locate, record and preserve the giant specimens of American trees." And the Engelmann spruce is but one of the monarchs found by the forest officers. A lodgepole pine in Iron Mountain Canyon of the Wasatch National Forest, in Utah, was reported by Bruce V. Groves, assistant forester, stationed at Salt Lake City. This new king—the first giant of the species reported—is ten feet, seven inches in circumference four and a half feet above the ground, is eighty feet tall, and has a crown spread of thirty feet.

Forest Ranger S. D. Warner, with headquarters at Baker, Nevada, reported a curlleaf mountain-mahogany near the Lehman Creek campground on the Nevada National Forest that displaces the former king of the tribe *Cercocarpus ledifolius* in Lake County, Oregon. The Nevada tree, four and a half feet above the ground, has a circumference of ten feet, seven inches, is twenty-four feet high, and has a crown spread of sixty-seven feet—a truly fine specimen.

Many other giants were reported from the region, and only lack of space prevents their being listed here. One of them, a Rio Grande cottonwood, *Populus wislizeni*, measured by Forest Ranger Owen DeSpain, of Moab, Utah, is of such unique interest that it will be presented in the next issue. It is a giant of

magnificent proportions and unusual beauty.

Coming east to the mountains of West Virginia, Stephen Spurr, assistant professor in the College of Agriculture, Forestry and Home Economics, West Virginia University, reports a sugar maple on the property of Bethany College, at Bethany, that topples the great North Kingsfield, Ohio, tree from its throne. The Bethany tree has a circumference of seventeen feet, six inches four and a half feet above the ground, whereas the Ohio sugar maple is sixteen feet, ten inches in girth. The height of the Bethany tree is 110 feet, that of the Ohio tree but eighty; its limb spread is seventy-five feet, seven feet less than the spread of the former king.

The new king, writes Mr. Spurr, stands in a 100-acre tract of virgin timber adjoining the college campus. "The predominant species is white oak and many exceed thirty-six inches in diameter at breast height, although the largest trees are of other species. Besides the sugar maple, we found a fifty-six-inch red oak, a fifty-two-inch yellowpoplar (tuliptree), a fifty-six-inch sycamore and a thirty-eight-inch honey locust—all diameter measurements at breast height." The great maple, reports Mr. Spurr, is a forest-grown tree and its butt is hollow, large enough to hold three or four men. "It stands near the top of a high ridge overlooking Buffalo Creek at an elevation of 1020 feet."

The crown of the southern red oak near Sudley, Maryland—a giant with a circumference of twenty-three feet, five inches, height of 105 feet, and limb spread of 129 feet—is being seriously challenged by a monarch of this species at Urania, Louisiana. And it is an interesting duel—a contest between a giant growing in the open and one growing in a forest. The Louisiana oak, the forest-grown tree, reported by Professor H. H. Chapman of the School of Forestry, Yale University, New Haven, Connecticut, has a circumference of twenty-two feet, eleven inches four and a half feet above the ground—six inches less than the circumference of the open-grown tree in Maryland, measured and nominated by F. W. Besley, former state forester. In height, however, the forest-grown Lou-

isiana oak, reported as 135 feet, towers over the Maryland tree by thirty feet. Yet the 129-foot limb spread of the open-grown tree naturally is greater than that of the forest-grown tree—how much is not known, as the spread of the Louisiana oak was not reported by Professor Chapman.

Which is king? The rule applied by The American Forestry Association in determining such matters when all measurements are available is: circumference (in inches) plus height (in feet) plus crown spread at widest point (in feet). Applying this formula to the case of the two giant southern red oaks, for circumference and height only, the forest-grown Louisiana tree registers 400 points, the open-grown Maryland tree 387. But add the great limb spread of the open-grown tree—129 feet—and the Maryland tree has 516 points. To equal this the Urania oak must have a crown spread of 116 feet—and this is asking a great deal from a forest-grown tree. But regardless of the final outcome, which will be reported in a later issue, both trees, the open-grown and forest-grown, deserve equal honor on the roll of American big trees.

Swinging to the Southwest, a new discovery has toppled the famous alligator juniper of the Gila National Forest, New Mexico, for years believed to be the largest *Juniperus pachyphloea* in existence. The new king, located in the Santa Rita Mountains of the Coronado National Forest,



Largest forest-grown southern red oak is this 135-foot high giant at Urania, Louisiana



Alligator juniper in the Coronado National Forest, Arizona — new king of its tribe

Arizona, is nineteen feet, eleven inches in circumference four and a half feet above the ground, is seventy-one feet tall, and has a crown spread at the widest point of seventy feet. It was measured by Forest Ranger Edward Engstrom of the Coronado Forest and reported by Frank C. W. Pooler, regional forester for the Southwestern region of the United States Forest Service. The Gila juniper is seventeen feet, five inches in circumference and seventy-two feet tall.

But while we pay tribute to these giants of forest and field, honor also should be bestowed upon the Valley Forge Dogwood Association, in Pennsylvania, and its president, Adolf Muller of Norristown. To honor the men and women of Montgomery County, Pennsylvania, who are serving in the armed forces, school children during Arbor Day this year planted 47,000 "Victory" dogwood trees—the gift of Mr. Muller. Seedlings were supplied to all public and parochial school children for planting at their homes or any other appropriate place.

CUCUMBER TREE

Magnolia acuminata, Linnaeus

By G. H. COLLINGWOOD

OF seven tree-size magnolias native to the United States, the cucumber tree is most hardy. Never common, but usually scattered throughout the forest, its range extends from southern Ontario and central New York through southeastern Illinois and the Appala-

chian Mountains to southern Alabama and central Mississippi. It also occurs in Arkansas and southern Missouri. Forest-grown trees are fifty, eighty, or rarely one hundred feet tall, with trunks three to four feet in diameter which may be clear of branches for fifty feet or more. The trunks of open-grown trees support long, sweeping, ground-touching limbs, while the relatively slender upper branches ascend to form a broad pyramidal outline. It is the largest of the magnolias.

A rapid grower maturing in eighty to 120 years, it does best in loose, moist, fertile soil on low mountain slopes, along the banks of streams and in narrow protected valleys. It attains maximum size and greatest abundance in narrow valleys at the base of the Smoky Mountains of North Carolina and Tennessee. Its

companions include the tuliptree, white oak, white ash, sugar maple, and the hickories.

The name *Magnolia* commemorates the work of Pierre Magnol, an early eighteenth century professor of botany at Montpellier, France; *acuminata* refers to the sharp points of the simple alternate leaves whose smooth upper surfaces are dark green, with the undersides pale and slightly hairy along the veins. They are seven to ten inches long, four to six inches wide, papery thin, with prominent midribs and smooth wavy margins. In autumn they turn pale yellow before falling and leave narrow elevated scars on the slender, shiny twigs.

Perfect, bell-shaped, green or pale yellow flowers appear from April to June. Their six petals are pointed, two to three and a half inches long, and so similar to the young leaves which precede them as to be frequently overlooked.

The fleshy fruit resembles a two or three inch long cucumber. Hence the name. First green, then pink, and at maturity a purplish red, it has several scar-

In winter the straight trunk, the drooping lower branches and ascending upper ones serve as an aid in identifying an open-grown tree



In the forest the cucumber tree is straight and tall, but in the open, with limbs often sweeping the ground, it develops a conical crown



let, one-celled seeds which grow on the surface like scattered kernels on a corn cob. When fully ripe the seeds drop away to hang singly by slender white threads. Once on the ground, they may remain in the duff until the second spring before germinating. The many seedlings resulting from a seed crop are so intolerant of shade that few grow large enough to be noticed and even fewer reach maturity.

The firm grayish brown bark is one half to three quarters of an inch thick, broken and covered with small scales. Narrow ridges flow one into the other and are divided by long, vertical grooves.

The yellow-brown heartwood, sometimes streaked with shades of green, has narrow white sapwood similar to that of the tulip-tree. When air dry it weighs twenty-nine pounds to the cubic foot. Without special strength, it is soft, durable, close-grained, porous and works easily. Its uses include crates, boxes, cheap furniture, cabinet work, interior finish and flooring.

The bark gives little protection against light surface fires, and scale insects may attack the branches, but in general this tree has few enemies.

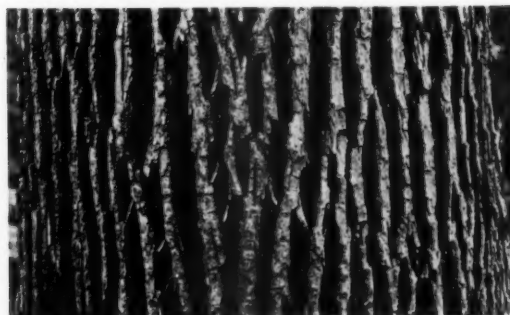
The symmetrical form, the almost tropical foliage and the scarlet late summer fruits encourage its ornamental use in the eastern states and in central Europe. It is readily grown from seed, but the brittle roots demand special care in transplanting. Seedlings are used as root stock on which to graft the several varieties of ornamental magnolia.



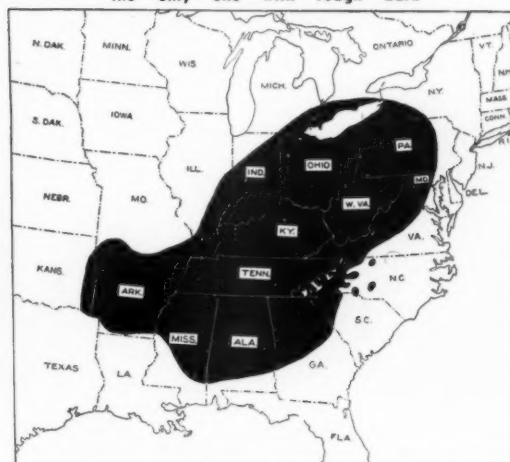
The large knobby fruit is first green, then pink, and finally red at maturity when the several scarlet seeds drop



The flowers of this magnolia are inconspicuous because they are of the same pale green color as the spring foliage which is present when they bloom



This magnolia is easily identified from others of its kind because it is the only one with rough bark



Natural range of the Cucumber Tree

Beating the "Bush" for Chewing Gum

(From page 341)

endure shade while young and to attain a crown height equal to competing species. In the most luxuriant tropical forests the jungle ceiling may be 150 feet above the ground, with giant trees forming a dense cover that from the air looks solid enough to walk on.

There is a long trail from the chicle bush to the pack of chewing gum you purchase for a nickel. It starts with the latex, which is about the color and consistency of cream. This is drained from the laticiferous vessels in the inner bark of the sapote tree, outside of the cambium layer. The latex in the ducts that have been tapped is not renewed and latex tubes have to form in the growth of new inner bark before there is another commercial yield. That is why the trees are tapped only once about every six years.

The latex in the bark of many tropical trees, including chicle and rubber, seems to have no direct or vital function in the life process of the trees, as does the sap. Unlike the Heavea rubber tree, the sapote does not respond to the stimulus of daily or frequent wounding. Instead, the latex runs out of the tapped tubes in a few hours, like water out of a pipe with no intake. A full flow occurs only during the rainy season, and some trees may not run even then. A tree may react to a shower that only wets the leaves and barely moistens the ground.

The tapping is done and the latex gathered by native Indians who take pride in the name of *chicleros*. They are skilled workers and mainly dependent on chicle for their livelihood. Only a comparatively few qualify, for the job requires the endurance to travel the

jungle, the strength to climb and tap the trees, and the special skill to use properly the long machete that is the tapping tool and indispensable instrument of their daily life. Working usually as groups of men or families, the *chicleros* establish thatched-roof camps at water holes where they live a hard, primitive life during the eight rainy months of the chicle season. Their diet of rice and beans, with occasional wild parrots or other game, and a bit of corn and squash, ignores most of the vitamin requirements, and the water they drink will sometimes almost crawl out of a cup. Yet the chicle they produce from thousands of square miles of almost inaccessible jungle adds up to millions of pounds.

As a typical day in a *chiclero* camp, the men go out early in the morning and during the forenoon each will tap ten or a dozen trees within the usual three-mile working radius of the camp. The tapping is done by climbing the tree with the aid of spurs, such as telephone line-men use, and perhaps a supporting rope. First, however, a test hack or calar cut is made at the base of the tree—it must be over ten inches in diameter—to see if it will run. Trees that do not show an immediate flow of latex are left until another season.

The actual tapping calls for care and skill in combining the best yield with the least damage to the tree. Starting at the top, the *chiclero* makes machete cuts from one-half to three-quarters of the way around the trunk in an open herringbone pattern, with each angled cut joining the one below. The latex from all of the cuts thus finds its way to

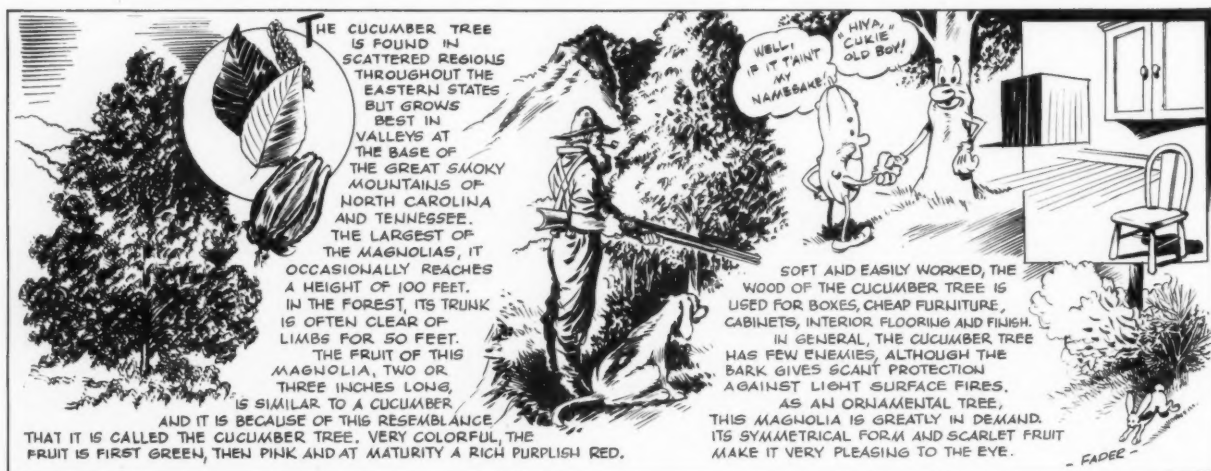
one point at the base of the tree, where a palm leaf is inserted as a gutter and a canvas bag is hung to catch the fluid. As the heat of midday approaches the *chiclero* makes the rounds of the trees he has tapped, gathers up his bags of latex and carries them into camp, where it is boiled down in large kettles.

The result is a solid block of crude chicle which is broken up into pieces of about twenty-five pounds each and packed out many miles on mules to the receiving station. Here it is graded and packed in 150-pound bags for air transport to Puerto Barrios. The Douglas D-2 planes in service carry about 5,000 pounds of chicle. An eleven-year-old Ford tri-motored plane was also in service last year, shuttling chicle, freight and passengers back and forth over the jungle and occasionally slipping down over the mountains to Guatemala City. The Indians take this jungle plane service as much for granted as their mules, which is a clue of things to come.

The chicle bush is all public domain. Concessions or leases are granted by the government to contractors, who assign operating areas to their *chicleros* and pay them given amounts by weight for the chicle delivered at receiving points, usually at jungle landing fields. The American purchasers buy the chicle from their contractors and make their own arrangements for financing the operations. It is a far-flung enterprise that at present extends over most of the workable bush in the states of Tabasco and Campeche in Mexico, Petén in Guatemala, and in northern British Honduras.

Conservation of the chicle resources
(Turn to page 365)

TREES AND THEIR USES—No. 75—CUCUMBER TREE





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lumber — was produced in 1942 by the forest industry. Wood fills the needs and does the jobs for a nation at war . . . This wood that goes to war is replaceable like other agricultural products, Timber is a Crop which grows and grows again.

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CONSERVATION IN CONGRESS

CONSERVATION interest in Congress during the past month centered upon two subjects — (1) the appropriations which the Congress will provide to maintain the work of federal conservation agencies during the fiscal year beginning July 1, and (2) a series of hearings held by the House Public Lands Committee on Representative Barrett's bill (H.R. 2241) to abolish the Jackson Hole National Monument, created by an executive order of the President on March 15. At the time of going to press, neither of these subjects had reached a conclusive stage.

Senate Increases Forestry Items

The prospect for 1943-1944 funds for the Forest Service, however, had taken on a much improved outlook as a result of the Senate Committee on Appropriations increasing very substantially forestry items in the agricultural appropriation bill which had been drastically reduced by the House. Notable among items increased were forest fire prevention and forest research. Under the former the Senate committee recommended a total of \$6,300,000 for cooperative forest protection under the Clarke-McNary law and \$2,151,711 for emergency forest fire control on the national forests. Forest research activities were increased in the aggregate by nearly \$750,000.

The forestry items as increased by the Senate over those carried in the House bill passed April 19 are given below:

	House	Senate
Forest Fire Cooperation under Clarke McNary law	\$2,492,210	\$6,300,000
Emergency Forest Fire Control on National Forests		2,151,711
Farm and Other Private Cooperation Forest Plantation Care on National Forests	646,168	808,110
Forest Research		415,000
Forest Management	\$300,000	\$542,000
Range Investigation	150,000	267,200
Forest Products Laboratory	800,000	989,765
Forest Survey	100,000	199,363
Forest Economics	75,000	118,500
Forest Influences	75,000	132,600
Total Forest Research	1,500,000	2,249,428
Forest Insect Control	150,000	199,680
White Pine Blister Rust	1,900,000	1,946,342

Russell Amendment Passed

If the \$6,300,000 recommended by the Senate committee for cooperative forest protection under the Clarke-McNary Act is finally approved by Congress, it will be the largest amount ever appropriated under the Act. Of the total amount recom-

ommended, \$4,000,000 would be expendable under the regular matching provisions of the Act. The remaining \$2,300,000 is for emergency use on areas considered critical from a military standpoint. An amendment by Senator Russell, which passed the Senate on June 7, will, if approved by the House, free this emergency item from the matching restriction. On June 11 the entire bill passed the Senate, and is now in Conference Committee, which means that the Senate increases may or may not hold in full or in part.

In respect to the increases for emergency forest protection, the Senate committee specified that they were made available for protection of forests against unusual hazards growing out of the war and are not to be considered as a permanent program or precedent.

Dutch Elm Disease

Continued control of the Dutch elm disease was likewise dealt with favorably by the Senate, which restored research funds cut by the House for forest pathology and forest insects. It also eliminated from the House bill two provisions which would operate to obstruct the control work of the department.

The National Resources Planning Board operating funds were completely cut off by the House. The Senate approved a reduced appropriation of \$200,000. This item is carried in the independent offices' appropriation bill which has been passed by both Houses. On

June 15 House members of Conference Committee refused to agree with their Senate colleagues. The House later sustained its Committee but gave the agency \$50,000 to wind up its affairs. The Senate concurred. This kills the agency.

(Turn to page 360)



BEFORE we get too far along in our post-war thinking, it might be well to remember that a war is still to be won. Let's not sidetrack from that issue. There is a chance for you construction men to serve . . . to get into active duty on work to which you are accustomed. The "Seabees" are the Contractors of the Navy . . . they need men like you to build docks, bridges, airfields and roads. Naturally enough, this outfit, like the Engineers, uses Galion rollers and graders . . . know that they are dependable.

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ASSOCIATION OBJECTIVES

Adequate Forest Fire Protection by federal, state and other agencies.

Reforestation of Denuded Lands valuable for timber and wildlife.

Protection of Fish and Game and other wildlife under sound game laws.

Prevention of Soil Erosion

Preservation of Wilderness for Recreation Establishment of State and National Forests and Parks

Development of Forestry Practices by the forest industries.

Education of the Public in respect to conservation of resources.

Forest Recreation as a growing need for the development of the nation.

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7-43

CONSERVATION CALENDAR

Important Bills in Congress with Action

May 6 - June 10, 1943

Bills Enacted

H. R. 2346—Snyder—Making appropriations for the fiscal year ending June 30, 1944, for civil functions administered by the War Department. Passed House April 1, 1943. Passed Senate May 6, 1943. Approved June 2, 1943. Public Law No. 64.

Appropriations

H. R. 1762—Woodrum—Independent Offices Appropriation bill for the fiscal year ending June 30, 1944. Passed House February 17, 1943. Passed Senate May 27, 1943. In conference June 4, 1943.

H. R. 2481—Tarver—Making appropriations for the Department of Agriculture for the fiscal year ending June 30, 1944. Passed House April 19, 1943. Reported by the Senate Committee on Appropriations with amendments (No. 287) June 7, 1943. Under consideration in Senate June 10, 1943.

H. R. 2714—Cannon, Missouri—Making appropriations to supply urgent deficiencies in certain appropriations for the fiscal year ending June 30, 1943, and for prior fiscal years. Passed House May 18, 1943. Passed Senate May 28, 1943. In disagreement June 8, 1943.

H. R. 2719—Johnson, Oklahoma—Making appropriations for the Department of the Interior for the fiscal year ending June 30, 1944. Passed House

May 20, 1943. Referred to the Senate Committee on Appropriations May 24, 1943.

Fish and Wildlife

S. 1152—McCarran—To provide for the conservation of wildlife on public lands and reservations of the United States. Introduced June 1, 1943. Referred to the Committee on Public Lands and Surveys.

National Monuments

S. 1046—O'Mahoney—To repeal Section 2 of the "Act for the preservation of American Antiquities." Reported without amendment (No. 296) by the Senate Committee on Public Lands and Surveys June 9, 1943.

H. R. 2241—Barrett—To abolish the Jackson Hole National Monument as created by Presidential Proclamation No. 2578, dated March 15, 1943, and to restore the area embraced within and constituting said national monument to its status as part of the Teton National Forest. Introduced March 19, 1943. Referred to the Committee on the Public Lands. Public Hearings held May 14-June 8, 1943.

Research

S. 1167—Holman—To provide for the establishment and maintenance of forest products pilot plants. Introduced June 7, 1943. Referred to the Committee on Agriculture and Forestry.

LAST CHANCE TO TRAIL RIDE

Two trips of "Trail Riders of the Wilderness" already have been over-subscribed. A third trip is now being organized—into the peaceful Flat Tops Wilderness of the White River National Forest, Colorado. Here you will find the perfect tonic for frazzled nerves and depleted strength and here the wilderness will put you in condition to tackle vigorously your important part in winning this war.

But to take the trip you will have to act quickly, as the party is limited to thirty riders and is rapidly filling up.

Expedition No. 3 of the Trail Riders of the Wilderness is scheduled to leave Glenwood Springs, Colorado, on July 28 for an eleven-day horseback trip into the glorious region of virgin fir and spruce, high mountain peaks, and clear, blue lakes. This is magnificent riding country and abounds in wildlife. The many lakes offer excellent opportunities for real fishing. The cost of the pack trip is \$143 from Glenwood Springs.

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"Tree Lady" Retires

Miss Margaret March-Mount, widely known as the "Tree Lady" because of her crusading work for forest conservation, retired in June after thirty years of service with the U. S. Forest Service.

Born in Illinois, Miss March-Mount went to the Pacific Coast early in life. She started her work with the Forest Service as a clerk in the office of the Bighorn National Forest at Sheridan, Wyoming, and was later sent to the Shoshone National Forest at Cody, Wyoming. She was responsible for the revival of much of the Buffalo Bill history, through her extra-curricular work with the Cody Club while there.

In 1928 she was transferred to Munising, Michigan, as administrative assistant and later to the public relations staff of the Regional Office, Milwaukee.



Margaret March-Mount

The "Squirrel Club," which originated in Minnesota, is now a national organization — largely through Miss March-Mount's efforts. Prospective candidates for membership in this Club must climb to the top of a lookout tower and sign a pledge to prevent forest fires caused by human acts. Through her activities, reforestation has been greatly stimulated. She assisted many women's organizations in planning forestry programs, and went from town to city all over the country writing, and talking to clubs and educational groups. School children were especially enthusiastic in their response to the "Tree Lady" and planted thousands of acres of school forests in her trail.



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OTHER PUBLICATIONS

A list of Selected Books on Forestry and related fields of Conservation is available to members of The American Forestry Association on request.

WORLD MINERALS AND WORLD PEACE, by C. K. Leith, J. W. Furness and Cleona Lewis. The Brookings Institution, Washington, D. C. 292 pages, numerous tables, graphs and maps. Price \$2.50.

This book starts with an account of the distribution and consumption of the world's metal, coal, petroleum, and important inorganic chemical deposits, which serves as a prelude for a description of the international struggle for control of these resources. The book ends with a discussion of the problems involved in working out equitable distribution of supplies as between nations. The inherent difficulties in so doing, in a world where nature distributed her wealth without relation to man-made boundaries, is stressed.

From a conservationist's point of view it is interesting that the authors point out the extent to which certain large deposits have already been exhausted. Furthermore, in their opinion, few more such deposits of important minerals will be discovered.

A similar study of forests as related to the problem of a better organized world would be of great value.

POND, LAKE AND STREAM FISHING, by Ben C. Robinson. Published by David McKay Company, Philadelphia. 370 pages, illustrated. Price \$2.50.

Advice and information for every kind of fresh water angling—trout, bass, muskellunge, or just plain pan fish. The author is outstanding in his field, having served as angling editor on the staffs of five of the more popular sporting magazines. Here he gives the facts to novice and expert alike in an authoritative and delightful way. No fresh water fisherman should miss this one.

COMMON EDIBLE MUSHROOMS, by Clyde M. Christensen. Published by the University of Minnesota Press, Minneapolis, Minnesota. 116 pages, illustrated. Price \$2.50.

Designed to acquaint the novice with the pleasures of hunting and eating wild mushrooms, this small, profusely illustrated volume enables the reader to distinguish between poisonous and edible varieties and supplies him with information necessary to hunt and gather them. A section entitled "The Fool-proof Four" describes four edible types with which the beginner may safely start his quest, although the characteristics of forty-seven edible varieties are set forth. There is a section on mushroom cookery which points out that, while their nutritive value is negligible, their delicious flavor more than compensates such a deficiency. A number of recipes for savory wild mushroom dishes are given.

WILDLIFE REFUGES, by Dr. Ira N. Gabrielson. Published by the Macmillan Company, New York. Illustrated. 257 pages. Price, \$4.00.

We now have in the United States and Alaska about 17,000,000 acres of wildlife refuges and sanctuaries, including nearly 4,000,000 acres for waterfowl. This valuable book is about this great system, by the man chiefly responsible for its actual development, Dr. Ira N. Gabrielson, director of the Fish and Wildlife Service of the Department of the interior.

Here is described the refuge system from the great waterfowl wintering grounds along the Gulf Coast to the wild and rugged islands of the Aleutian chain. There are refuges for all varieties of American wild birds and animals and Dr. Gabrielson presents them, their populations and their varied purposes. He does this with the conviction of one who is the leading authority on his subject, and in the language of a man who is profoundly aware of the romantic aspects of America's belated attempts to restore a rare and rich heritage that had all but vanished.

Here is history, accomplishment, vision. A *must* book for everyone interested in the present and future of our wildlife resources.

PEGGY PLANTS A TREE, by Rose Flynn. Published by Charles Scribner's Sons, New York, N. Y. Illustrated with line drawings. 69 pages. Price, \$1.50.

A story of Peggy and her interest in trees, which presents a convenient means of instilling an appreciation of trees in alert youngsters of today. The book contains much useful information as well as a glossary of leaves which will serve as a handbook in the identification of common trees.

Conservation in Congress

(From page 358)

Funds for the National Park, Indian, Grazing, and Fish and Wildlife Services of the Interior Department are resting in doubt in Conference Committee. The House curtailed Interior Department conservation funds for \$200,000,000 over those of 1943 and the emergency forest fire protection item for the public domain. The Senate Committee raised the House figures by \$2,218,805 including \$700,000 for emergency fire protection.

Jackson Hole Fight

The President's action of March 15 in creating by executive order the Jackson Hole National Monument in Wyoming has precipitated a congressional fight that threatens not only the Monument but the Antiquities Act under which it was created.

Two bills were introduced in Congress restricting executive authority to create national monuments. One by Senator O'Mahoney (S. 1046) is designed to take away the President's authority to create such reservations by repealing Section 2 of the American Antiquities Act of June 8, 1906. The other (S. 1056), sponsored by Senator Robertson, would require that no monument be created before consent of the state had been given. On June 9 the Senate Committee on Public Lands and Surveys reported favorably Senator O'Mahoney's bill without any public hearings.

As far as Jackson Hole itself is concerned the battle has centered around Congressman Barrett's bill of March 19 (H. R. 2241) to abolish the Jackson Hole Monument and allow the federal lands involved to revert to their national forest status. The House Committee on the Public Lands to which the bill was referred started hearings on May 14. Seven hearings have been held in Washington and the committee is considering holding further ones in Jackson Hole itself.

Proponents of the bill claimed that the Monument had been created by executive action after Congress had repeatedly refused to increase the area of the Grand Teton National Park, that the people of Jackson Hole and of Wyoming generally were opposed to the creation of the Monument and had been given no notice of presidential intentions and therefore no chance to protest. They further claimed that the area did not have the quality of historic or scientific interest necessary to justify its being set aside as a national monument and that the withdrawal of so large an area will destroy the cattle industry, the chief industry of the section.

The largest private holdings embracing 33,795 acres within the Monument belong to John D. Rockefeller, Jr., who is donating them to the government to become part of the Monument. Opponents of the Monument pointed to the loss of tax receipts of nearly \$10,000 a year to the local government if this land passes into government hands for park purposes. It was brought out in testimony that Mr. Rockefeller had stated that if the government did not take title he would make other disposition of them.

Supporters of the Monument took the stand that the President's action was entirely proper, that the historic and scientific interests of the region justified its creation under the Antiquities Act, that the will of Congress in the matter of extension of the Grand Teton Park had never been actually determined, that the grazing privileges would be protected long enough for economic adjustment to be worked out, that the increased tourist trade induced by the creation of the Monument would more than compensate for loss to the grazing industry. They admitted that the loss of tax revenue would be locally serious and proposed that it be remedied by congressional allocation of a larger proportion of park and monument fees to the states. They also claimed that the proponents of the bill are misrepresenting the sentiments of the people of Wyoming.

Among those testifying or filing statements for the bill were Congressman Barrett who introduced it, Senators O'Mahoney and Robertson, and Governor Hunt, Deputy Attorney General J. J. McIntyre, all of Wyoming, and Milward L. Simpson, president of the Board of Trustees of the University of Wyoming. Numerous individuals, business and civic groups from Wyoming also filed statements favoring the bill.

Among those opposing the bill were Secretary Ickes of the Interior Department, Newton B. Drury, Director of the National Park Service, other Interior Department and Park Service officials and Horace Albright, former Director of the Park Service. The effect of the creation of the Monument on the famous Jackson Hole elk herd was little discussed.

In the meantime, the Senate dropped a bomb into the Monument when on June 18 it passed the Interior Department Appropriation bill, carrying an amendment by Senator O'Mahoney providing that after July 1 no Interior Department funds shall be spent for administration of the Monument. The effect of this amendment, if concurred in by the House, will be to make the Monument, in which are included 160,000 acres of public lands and waters, virtually inoperative from the standpoint of administration and protection.



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By J. P. KINNEY, A.B., LL.B., M.F.

IN this book the author has not only outlined the general principles of the common law and statutory law as applied to trees and their products, and sketched the development of the law in America, but has also collected thousands of citations of court decisions interpreting the common law, the Federal statutes, and the statutes of various American states. Many British and Canadian decisions are also cited where applicable.

Every chapter contains information that will prove of inestimable value to any one who desires to ascertain easily and quickly the fundamentals of American timber law, or who needs references to court decisions to support a well-founded view as to the law upon any particular point.

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H. H. Chapman of Yale "Retires"

Professor Herman Haupt Chapman, one of the pioneers of American forestry, reached the age limit for active service as member of Yale Faculty this month. All those acquainted with his tremendous intellectual and physical vitality and capacity for hard work will understand that the word retire applies only in an official sense. Freed from teaching and other academic duties, it is to be expected that he will devote his entire time to furthering the cause of forestry as he has done for nearly a half century.

Born in New England in 1874, most of his early life was spent in northern Minnesota during the heyday of "cut

analysis on some fifteen college generations of forestry students.

The volume of his professional labors is indicated by the authorship of over 400 publications covering practically every phase of forestry and conservation activities. His publications range from textbooks of wide scope acknowledged as authoritative in every country in the world to short and pithy articles dealing with minute technical points and exposing loose professional thinking.

The extent of his leadership in public and professional affairs is attested by a partial list of offices he has held. He was a director of The American Forestry Association from 1911 to 1922, President of the Society of American Foresters from 1937 to 1939, a member of the Connecticut Park and Forest Commission since its organization in 1913 and President of the Connecticut Forest and Wildlife Commission since 1929. He was one of the first American foresters without European training to be elected a Fellow of the Society of American Foresters. Always a forceful figure, Professor Chapman has led many fights for what he believed to be sound courses of action in the conservation field.



Prof. H. H. Chapman

out and get out" lumbering. Shortly after graduation from the University of Minnesota he became superintendent of an agricultural experiment station in the cut-over region of that state and soon became aware of the evils of forest destruction. His early work there laid the foundation for later developments in forestry in Minnesota.

Two years after graduation from the Yale School of Forestry in 1904, he joined its faculty and in 1911 attained to the Harriman Professorship of Forest Management. Except for brief periods when on leave to conduct responsible work for the U. S. Forest Service, his entire career was spent at Yale, where he stamped the impress of his high professional ideals and keen powers of

John N. Tinker Made Georgia State Forester

On June 10, Governor Arnall appointed John N. Tinker, of the Forest Survey Division of the U. S. Forest Service, as the new State Forester for Georgia. He succeeds Walter Dyal.

Mr. Tinker has been associated with the Forest Service for the past twelve years, serving with the Forest Survey under Capt. I. F. Eldredge, and has been actively engaged in the Service's naval stores organization work since 1936. He was supervisor of the Savannah, Georgia, District of the Naval Stores Conservation Program until his appointment as State Forester of Georgia.

Before joining the Forest Service, Mr. Tinker was Professor of Forestry at the University of Georgia, his *alma mater*, as he was graduated from the George Foster Peabody School of Forestry there in 1924.

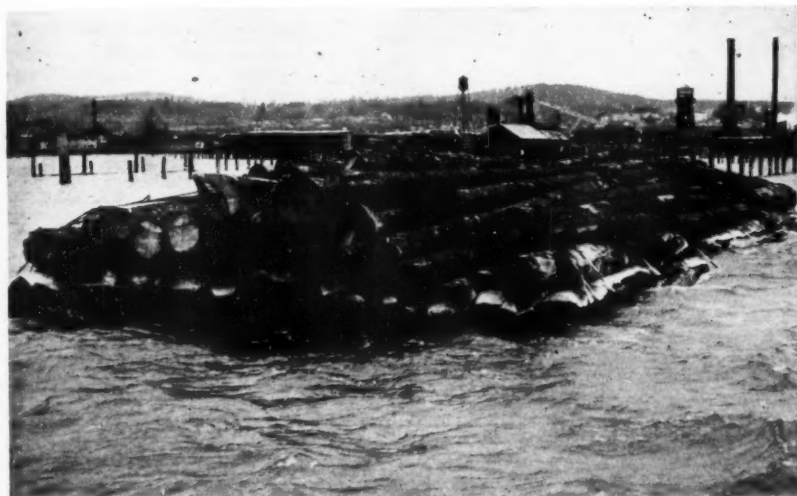
The appointment met with general approval because Mr. Tinker is not only thoroughly familiar with naval stores operations and the forestry problems of the South, but specifically those of Georgia. His training, Southern background and long experience are eminent qualifications of the new State Forester.

Aircraft Lumber

(From page 343)

"It's plenty tough, but it's a job we've got to do to beat the Axis. We're doing our best." They are doing their best, these men in the woods and mills, as is evidenced by a statement made recently

tree-hood have joined the air corps. For the past two years some of the more ambitious members of the conifer family have silently gone off to see action in the RAF and the RCAF. Now they



With demand threatening supply in Northwest Sitka spruce, the United States Forest Service was given the task of tapping the spruce forests of Alaska. This large raft of a million board feet of high grade spruce was the first to make the 900-mile journey to Puget Sound. It is two-thirds under water

by Fred Brundage, western log and lumber administrator for the WPB. "Production of aircraft lumber in the last quarter of 1942," he said, "increased five-fold over the same period in the second quarter of the year."

Getting out aircraft lumber suitable to pass the rigid inspection requirements of the government inspectors calls for an entirely new technique in sawmilling and costly and slower production in the mills. Logs which show evidence of containing valuable grades have to be handled carefully so that each log will yield the most pieces of selace, firace, air screw, or AN "specs." Selace (spruce) is more desired than firace (Douglas fir). The air screw grade is stock for most of the propellers which pull the mightiest English bombers and the tiny, fast-as-sound fighters.

Forty different types of British war-planes, among them names familiar to everyone, are built all or in part of wood—wood from the forests of the Pacific Northwest. The list of American fighting planes utilizing wood is nearly as long, despite the fact that the British had an early start in its use.

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Wild Rice

(From page 345)

air. In this way the loosened husks are separated from the rice by winnowing, the breeze carrying away the chaff.

After observing Indian processing methods for several years, Williams decided to mechanize the whole procedure. Since the Indians relied on the harvest as a source of income, Williams figured that if he could speed up the processing of rice, the natives could devote all their time to gathering the grain.

Located many miles from the nearest town, Williams decided to manufacture his own equipment, utilizing discarded metal oil drums. These he geared to gasoline motors, to be turned over open fires. Thus was the grain parched. Inside several drums he set wooden pegs, and when these were revolved slowly half-filled with rice, the same result was obtained as in dancing—and with less breakage to kernels. Further treatment consisted of passing the rice through a regular fanning mill where blowers removed chaff and dust, screening out broken kernels.

Seed intended for planting must be sacked as soon as it is gathered, and the sacks submerged in water. It is extremely important that the seed be kept continuously wet until time for shipment. If packed in two-ply burlap and expressed to its destination, the seed will stand a two-weeks' journey.

The best time to sow the seed in the middle and northern tier of states and in Canada is in spring after the northward migration of ducks is past. If sown in the fall, the loss from ducks is heavy, and again in the spring when seedlings have germinated.

Seed must be sown in shallow water that is not stagnant, preferably in water with a slight current. It is sown broadcast after being allowed to soak for twenty-four hours. Good seed will sink to the bottom when dropped in a container of water; that which floats should be removed and thrown away. Seed that has dried out may not germinate the year it is planted, but if drying has not killed the germ, chances are that it will produce the following year.

In using his floating harvesting machine, Williams found that where the paddle wheel disturbed the mud bottom in open water, rice would grow in its wake the following year. By using the paddle wheel as a cultivator after the harvest, Williams has greatly extended the area covered by rice and improved the stand when areas were getting thin. The size and quality of seed have also been improved by this method of cultivation.

New Chestnuts for Our Forests?

(From page 333)

stream banks, and woodland openings.

Three species of *Castanea* appear to be very promising for use in the development of such food-producing plants. One species is the Seguin chestnut of China, a small tree in its native habitat, but usually a bush in this country. This species is everbearing and apparently very resistant to chestnut blight. The everbearing habit is inherited as a dominant characteristic. Some of the hybrids produce two or more distinct crops of nuts in one year. Others produce a continuous crop of burrs, ranging from mature nuts at the lower part of the branch to pistillate flowers at the outer end of the branch. As this bush flowers and fruits into frost, its terminal growth usually is killed back, especially in the vicinity of Washington.

The second species is the trailing chinkapin (*Castanea alnifolia*), native to some of the Southern States. This chinkapin propagates itself not only by seeding but also by stolons or underground runners. It thrives on sandy soils in woodland openings and at the edges of pine-oak woods. Another of its interesting characteristics is that it comes back the year after a burnover and produces nuts on the first year's growth.

The third species, also a chinkapin, grows in eastern Texas, and it may be a variant of *C. alnifolia*. Its species name is *paucispina*, meaning few spines on the burrs. This chinkapin and the trailing chinkapin have been crossed with forest types of Japanese chestnuts, also with the Chinese chestnut and the Seguin chestnut within recent years. It is too early to determine the growth and fruiting habits of their progeny.

The Division of Forest Pathology produced approximately 6,500 chestnut and chinkapin hybrids from 1925 to 1942. Many have died from natural infections of the chestnut blight fungus, and many have been discarded because of various defects. Besides natural exposure to blight infection, all hybrids must be inoculated artificially with the blight organism to determine which trees are most resistant. Additional crossings of selected resistant hybrids usually are necessary to attain the desired characteristics of rapid and upright growth.

Results thus far attained in forest chestnut breeding justify the belief that continued breeding experiments will produce new hybrids having increasingly finer qualities and greater blight resistance.

Beating the "Bush" for Chewing Gum

(From page 354)

centers first on the tapping methods, so as to extend the life of the trees beyond the present limit of three workings at intervals of six years. Despite the manual dexterity of the *chicleros*, it is almost impossible to avoid cutting through to the cambium at some of the points where the cuts join. There are also careless or unskilled *chicleros* who leave the mark of poor workmen. The result is that nearly every tapped tree has several points where decay will start under the bark. This gradually reduces its yield, perhaps will kill the tree. Extensive studies have been made of improved tapping methods and tools, but the hard bark of the sapote makes it difficult to tap the latex tubes with any kind of a gouge or modified turpentine hack. Also the exclusive use of the machete for generations makes that the only tool the *chicleros* are willing or able to use. Any means that could be taken to increase the replacement and growth of sapote would be desirable, but a tropical forest is not a very inspiring place to attempt forest conservation and improvement.

The most that can be expected from

this glimpse of the chicle bush is to give a little better appreciation of what is involved in the background of the pack of chewing gum we have long taken for granted. The fact that much of the chicle originates in the forests of the Yucatan Peninsula and adjacent region, where the Maya civilization once built its homes and cities, gives an added interest to the production cycle. No records reveal the condition of the lands and for-

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ests when the First Empire flourished, so we can only wonder at the transformation that has taken place over the centuries while the present forest came into being and the jungle growth covered the temples and hopes of a vanished people. A giant sapote, estimated by an archeol-

ogist to be a thousand years old, was found growing on the ruins of a Maya temple, so the "chicle tree," with its hidden promise of chewing gum, goes back to early Mayan days and probably thrived long before men emerged from their caves to build temples.

Wildlife Contributions to the War

(From page 330)

can be increased tenfold.

Other than the Great Lakes, our inland waters, even those of the major river systems, are a neglected fishery resource. They have never marketed a large volume of fish in comparison with the total American production. This is not because the fish are not there. The great middle section of the nation in particular has untold quantities of carp, buffalo, drum, bowfin, catfish, suckers, and other varieties of so-called "rough" fish. Despite deep-seated prejudices practically all are edible and of high food value. The reservoirs of the Tennessee Valley Authority are prolific sources of such fish. The million pounds of spoonbill catfish annually taken from them could be increased many times. Little known Eagle Lake in Mississippi recently produced 450,000 pounds of fish, all capable of being used for food, in two months' seining operations. Better utilized, the thousands of farm ponds built through the South by farmers as a part of soil and water conservation programs can produce additional millions of pounds of pan and game fish. The federal fish hatchery program has been realigned to provide suitable seed stock for these farm ponds and information is being furnished to interested individuals on how to increase production by proper fertilization of the waters. Seven north central states alone could undoubtedly yield a minimum of twenty-five million pounds of carp annually.

Can we afford to neglect in war or peace this wealth of food of our inland streams, lakes and ponds? This resource is under control of the states. They have different policies regarding it. Many states are taking or permitting the take of rough fish primarily to improve conditions for game fish. Others are doing what they can to popularize them among consumers. Even so, only a start has been made. Studies of methods of processing, handling, and cooking these fish so as to give them better flavor and keeping qualities are in progress. Public institutions feeding large numbers of people may be the first to profit from this research. Publicity and more publicity is needed to demonstrate the value of these "cast-offs" of previous years. Taking and consuming these neglected fish will be good wildlife management

as well as a boost for the national food economy.

Other studies have been initiated to determine ways to encourage the consumption of fish near where they are caught. Salmon and halibut are now shipped from the Pacific to eastern markets, while oysters, flounders and other Atlantic fishes are transported far inland. In these days of over-taxed railway transportation, a less complex distribution system would be welcome.

It is estimated that if some of the most pressing problems of distribution, manpower, equipment and materials could be overcome and if the fishing industry could function on a normal or an accelerated basis, the commercial fishery products could be increased from the 4,900,000,000 pounds of 1941 to more than six billion pounds. This increase, however, would be dependent upon a better coordination of the many interests involved.

In all these wartime problems of fishery management and wildlife utilization, administrators have an opportunity to introduce better management methods. Good management in wartime is no different from good management in peacetime but many obsolete laws and practices continue because of the inability of the administrators to induce the sportsmen to accept changes. There was never a better opportunity to make these adjustments. With the urgent need to insure that the resource produce all it can in the way of recreation and food, management practices can now be initiated that would be most difficult in normal times.

Some states have already made considerable progress. South Dakota, faced with possible damage to crops by a record pheasant population this year, extended the normal hunting season of ninety days by an additional thirty days and permitted hunting in thirty-seven counties from January 30 to February 28. Montana, when the problem of feeding the Yellowstone elk herd this winter became acute, organized a special hunt at which approximately 7,000 animals were taken and the meat put to good use. In contrast, other deer and elk herds suffered heavy winter losses because the hunters failed to reduce the size of the herd and not enough winter feed was



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available. In another instance, where wild ducks were causing unusual damage to standing crops, the Secretary of the Interior granted special authority for shooting on the damaged areas until the birds were driven out.

So, some progress is being made, and more will undoubtedly follow as the public becomes awakened to the problems confronting wildlife administrative agencies during these troublesome times. However, the danger of *overselling* the idea of utilization can be just as serious, or perhaps more so, than the philosophy that wild things are to be enjoyed only for recreational and esthetic values, and that no economic use should be tolerated. With increasing discomfords on the home front due to added restrictions in the purchase of food and clothing and with farmers and stockmen becoming less tolerant of wildlife populations that cause local depredations to crops, it is not difficult to visualize a growing demand for greater and greater game kills. Conservationists must see that the gains that have come so slowly during the past twenty-five years, are not cast aside due to wartime hysteria. Basic breeding stocks must not be raided. The management practices now adopted must be only those that will utilize surplus populations and will not endanger the future of the resource.

CREDIT FOR PHOTOGRAPHS

Credit for photographs appearing in this issue is acknowledged as follows:

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Hartley, C. A., page 348 (upper).
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U. S. Forest Service—pages 328, 329 (center), 349 (right).
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Wide World Photos—page 363.

WHO'S WHO

Among the Authors in this Issue

ALBERT M. DAY (*Wildlife Contributions to the War*) is Assistant Director of the U. S. Fish and Wildlife Service. Born in Nebraska, he majored in animal husbandry at the University of Wyoming. In the Signal Corps Service during the World War, he returned to Wyoming to take up wildlife and predatory control work and has been continuously with the Government, holding important consultant and administrative posts.



Russell B. Clapper

RUSSELL B. CLAPPER (*New Chestnuts for Our Forests?*) is a pathologist in the U. S. Department of Agriculture. During his twenty-one years with the Department, he has devoted most of his time to chestnut work, conducting surveys of the spread of the chestnut blight and breeding new chestnuts and chinkapins.

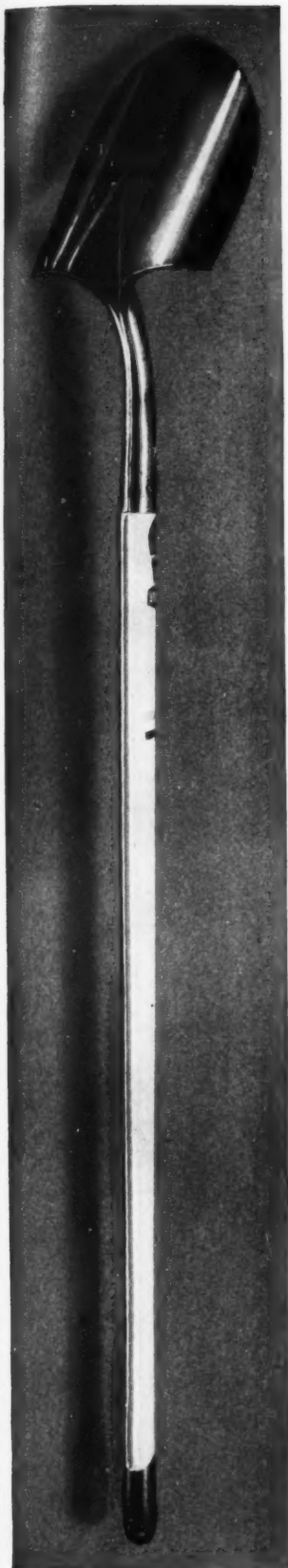
EDWIN WAY TEALE (*Your Friend—The Dragonfly*), native of Illinois, is a Columbia University man, free-lance writer and noted photographer. His keen interest in nature study—particularly of insects—led him to concentrate in that field, first as an avocation, then professionally. He has written many books, published both here and abroad, his *Grassroot Jungles* having been translated into Braille by the Library of Congress.

E. A. STERLING (*Beating the "Bush" for Chewing Gum*), outstanding forester, of Montrose, Pennsylvania, says he is "just another old-timer who has been around quite a lot since early Forest Service days." He travelled his first million miles some years ago, not counting automobiles, and is still chasing the "peculiar idea that forests should support foresters as a business enterprise."

ARTHUR W. PRIAULX (*Aircraft Lumber*), native Californian, was for twenty years newspaper man and owner-publisher. Mr. Priaulx now directs Oregon information and public relations for the Willamette Valley branch of the West Coast Lumbermen's Association.

ORMAL I. SPRUNGMAN (*Wild Rice*), of Minnesota, is a well-known contributor to magazines in the outdoor and photographic fields.

THE COVER—A combination photograph—Nature's-V, by Leon Cantrell, and the flag flown by the Lusitania on her maiden voyage, by National Photo.



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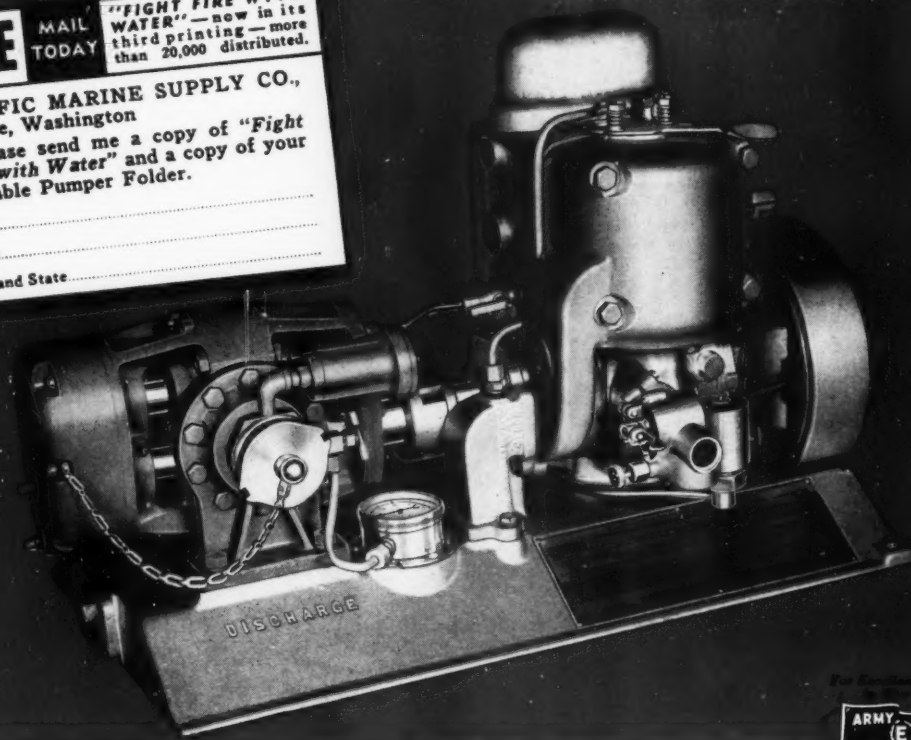
Plants:
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FREEMAIL
TODAY**"FIGHT FIRE WITH
WATER"**—now in its
third printing—more
than 20,000 distributed.**PACIFIC MARINE SUPPLY CO.,**
Seattle, WashingtonPlease send me a copy of **"Fight
Fire with Water"** and a copy of your
Portable Pumper Folder.

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TYPE "Y" PACIFIC PUMPER

THE MOST POWERFUL portable pumper ever built for its weight and size. Embodies improvements made possible only through

years of specialized engineering and thousands of actual usage tests. Proved by Government agencies.

PUMP—The famous NORTHERN PUMP is used on this type. Suction and discharge are both 1½-inch iron pipe thread, male connections.

MOTOR—The motor is of special design, two cylinder, two-port type, with alternate instead of simultaneous firing; two impulses per revolution instead of one. Quick starting. Positive action.

Power rating—9.8 H. P. at 4000 revolutions.

Bore—2½ in.

Stroke—2 in.

R.P.M.—Normal working conditions 4500.

Cylinders—Cast in one block, close grained, nickel-iron, bored, reamed

and honed to exact size. Ample cooling space.

Pistons—"Lo-Ex" alloy Lynite; 2 rings.
Connecting Rods—Steel, heat treated and ground to size.

Bearings—High grade double roller bearings on crankshaft and connecting rods.

Ignition—High tension flywheel magneto, with two coils and special type breakers for high speed service; maintains correct timing at all speeds. Oil and moisture proof.

Carburetor—Special design and make; float feed. Not a mixing valve.

Lubrication—Automatic, oil mixed with gasoline. Lubricates all moving parts.

Muffler—Built into base of unit. Cut-out in head.

SPECIFICATIONS

Pressure	100	125	150	175	200	225
Gallons per Min.	63	59	53	46	40	20

EQUIPMENT

Six feet of 1½-inch or 2-inch lightweight, non-collapsible suction hose, with aluminum strainer; all necessary tools; instruction book; two starter ropes; back pack gasoline can and flexible gas line.

SHIPPING INFORMATION

Dimensions: Base 24 in. by 12 in.; height 13 in. Net weight, complete, ready to operate, 70 lbs. Gross weight, boxed for shipment, 100 lbs.

PACIFIC MARINE SUPPLY COMPANY

SEATTLE, WASHINGTON

ESTABLISHED 1896—AMERICA'S LARGEST MARINE SUPPLY HOUSE

Exclusive Pacific Northwest Distributor for—

MARINE DIVISION, BENDIX AVIATION CORPORATION SHIPMATE RANGES
C.-O.-TWO FIRE EQUIPMENT COMPANY DEVOE AND RAYNOLDS PAINTS
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